STATE OF ILLINOIS
DWIGHT H. GREEN, *Governor*
DEPARTMENT OF REGISTRATION AND EDUCATION
FRANK G. THOMPSON, *Director*

DIVISION OF THE
STATE GEOLOGICAL SURVEY
M. M. LEIGHTON, *Chief*
URBANA

REPORT OF INVESTIGATIONS—No. 109

ILLINOIS MINERAL INDUSTRY IN 1944

BY

WALTER H. VOSKUIL and DOUGLAS F. STEVENS

PRINTED BY AUTHORITY OF THE STATE OF ILLINOIS

URBANA, ILLINOIS

1945

STATE OF ILLINOIS
DWIGHT H. GREEN, *Governor*
DEPARTMENT OF REGISTRATION AND EDUCATION
FRANK G. THOMPSON, *Director*

DIVISION OF THE
STATE GEOLOGICAL SURVEY
M. M. LEIGHTON, *Chief*
URBANA

REPORT OF INVESTIGATIONS—No. 109

ILLINOIS MINERAL INDUSTRY IN 1944

BY

WALTER H. VOSKUIL and DOUGLAS F. STEVENS

PRINTED BY AUTHORITY OF THE STATE OF ILLINOIS

URBANA, ILLINOIS

1945

ORGANIZATION

STATE OF ILLINOIS

HON. DWIGHT H. GREEN, *Governor*

DEPARTMENT OF REGISTRATION AND EDUCATION

HON. FRANK G. THOMPSON, *Director*

BOARD OF NATURAL RESOURCES AND CONSERVATION

HON. FRANK G. THOMPSON, *Chairman*
NORMAN L. BOWEN, D.Sc., LL.D., *Geology*
ROGER ADAMS, PH.D., D.Sc., *Chemistry*
LOUIS R. HOWSON, C.E., *Engineering*
CARL G. HARTMAN, Ph.D., *Biology*
EZRA JACOB KRAUS, PH.D., D.Sc., *Forestry*
ARTHUR CUTTS WILLARD, D.ENGR., L.L.D.
President of the University of Illinois

GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, *Chief*

(5908—3M—10-45)

SCIENTIFIC AND TECHNICAL STAFF OF THE STATE GEOLOGICAL SURVEY DIVISION

100 Natural Resources Building, Urbana

M. M. LEIGHTON, PH.D., *Chief*
ENID TOWNLEY, M.S., *Assistant to the Chief*
VELDA A. MILLARD, *Junior Asst. to the Chief*
HELEN E. MCMORRIS, *Secretary to the Chief*
EFFIE HETISHEE, B.S., *Geological Assistant*

GEOLOGICAL RESOURCES

RALPH E. GRIM, PH.D., *Petrographer and Principal Geologist in Charge*

Coal

G. H. CADY, PH.D., *Senior Geologist and Head*
R. J. HELFINSTINE, M.S., *Mech. Engineer*
CHARLES C. BOLEY, M.S., *Assoc. Mining Eng.*
BRYAN PARKS, M.S., *Asst. Geologist*
EARLE F. TAYLOR, M.S., *Asst. Geologist* (on leave)
RALPH F. STRETE, A.M., *Asst. Geologist*
ROBERT M. KOSANKE, M.A., *Asst. Geologist*
ROBERT W. ELLINGWOOD, B.S., *Asst. Geologist*
GEORGE M. WILSON, M.S., *Asst. Geologist*
JACK A. SIMON, B.S., *Asst. Geologist*
ARNOLD EDDINGS, B.A., *Research Assistant* (on leave)
RAYMOND SIEVER, B.S., *Research Assistant* (on leave)
JOHN A. HARRISON, B.S., *Research Assistant* (on leave)
MARY E. BARNES, B.S., *Research Assistant*
MARGARET PARKER, B.S., *Research Assistant*
FLO NELL OZELSEL, B.F.A., *Technical Assistant*

Oil and Gas

A. H. BELL, PH.D., *Geologist and Head*
FREDERICK SQUIRES, B.S., *Petroleum Engineer*
STEWART FOLK, M.S., *Assoc. Geologist* (on leave)
DAVID H. SWANN, PH.D., *Assoc. Geologist*
VIRGINIA KLINE, PH.D., *Assoc. Geologist*
PAUL G. LUCKHARDT, M.S., *Asst. Geologist* (on leave)
WAYNE F. MEENTS, *Asst. Geologist*
JAMES S. YOLTON, M.S. *Asst. Geologist*
MARGARET SANDS, B.S., *Research Assistant*

Industrial Minerals

J. E. LAMAR, B.S., *Geologist and Head*
ROBERT M. GROGAN, PH.D., *Assoc. Geologist*
ROBERT T. ANDERSON, M.A., *Asst. Physicist*
ROBERT R. REYNOLDS, M.S., *Asst. Geologist*

Clay Resources and Clay Mineral Technology

RALPH E. GRIM, PH.D., *Petrographer and Head*
RICHARDS A. ROWLAND, PH.D., *Asst. Petrographer* (on leave)
WILLIAM A. WHITE, B.S., *Research Assistant*

Groundwater Geology and Geophysical Exploration

CARL A. BAYS, PH.D., *Geologist and Engineer, and Head*
ROBERT R. STORM, A.B., *Assoc. Geologist*
ARNOLD C. MASON, B.S., *Assoc. Geologist* (on leave)
MERLYN B. BUHLE, M.S., *Asst. Geologist*
M. W. PULLEN, JR., M.S., *Asst. Geologist*
CHARLES G. JOHNSON, A.B., *Asst. Geologist* (on leave)
MARGARET J. CASTLE, *Asst. Geologic Draftsman*
ROBERT N. M. URASH, B.S., *Research Assistant*

Engineering Geology and Topographic Mapping

GEORGE E. EKBLAW, PH.D., *Geologist and Head*
RICHARD F. FISHER, M.S., *Asst. Geologist*

Areal Geology and Paleontology

H. B. WILLMAN, PH.D., *Geologist and Head*
CHALMER L. COOPER, PH.D., *Geologist*
HEINZ A. LOWENSTAM, PH.D., *Assoc. Geologist*

Subsurface Geology

L. E. WORKMAN, M.S., *Geologist and Head*
C. LELAND HORBERG, PH.D., *Assoc. Geologist*
FRANK E. TIPPIE, M.S., *Asst. Geologist*
PAUL HERBERT, JR., B.S., *Asst. Geologist*
MARVIN P. MEYER, B.S., *Asst. Geologist*
ELIZABETH PRETZER, A.B., *Research Assistant*
RUTH E. ROTH, B.S., *Research Assistant*

Physics

R. J. PIERSOL, PH.D., *Physicist*

GEOCHEMISTRY

FRANK H. REED, PH.D., *Chief Chemist* (on leave)
CAROL J. ADAMS, B.S., *Research Assistant*

Coal

G. R. YOHE, PH.D., *Chemist and Head**
HERMAN S. LEVINE, B.S., *Research Assistant*

Industrial Minerals

J. S. MACHIN, PH.D., *Chemist and Head*

Fluorspar

G. C. FINGER, PH.D., *Chemist and Head*
OREN F. WILLIAMS, B.ENGR., *Asst. Chemist*

Chemical Engineering

H. W. JACKMAN, M.S.E., *Chemical Engineer and Head*
P. W. HENLINE, M.S., *Assoc. Chemical Engineer*
JAMES C. MCCULLOUGH, *Research Associate*
JAMES H. HANES, B.S., *Research Assistant* (on leave)
LEROY S. MILLER, B.S., *Research Assistant* (on leave)

X-ray and Spectrography

W. F. BRADLEY, PH.D., *Chemist and Head*

Analytical

O. W. REES, PH.D., *Chemist and Head**
L. D. MCVICKER, B.S., *Chemist*
HOWARD S. CLARK, A.B., *Assoc. Chemist*
CAMERON D. LEWIS, B.S., *Asst. Chemist*
WILLIAM T. ABEL, B.A., *Research Assistant*
JOHN C. GOGLEY, *Research Assistant*
ELIZABETH J. EADES, A.B., *Research Assistant*

MINERAL ECONOMICS

W. H. VOSKUIL, PH.D., *Mineral Economist*
DOUGLAS F. STEVENS, M.E., *Research Associate*
NINA HAMRICK, A.B., *Research Assistant*
ETHEL M. KING, *Research Assistant*

LIBRARY

REGINA LEWIS, B.A., B.L.S., *Librarian*

PUBLICATIONS AND RECORDS

DOROTHY E. ROSE, B.S., *Technical Editor*
MEREDITH M. CALKINS, *Geological Draftsman*
BEULAH FEATHERSTONE, B.F.A., *Asst. Geologic Draftsman*
WILLIS L. BUSCH, *Principal Technical Assistant*
LESLIE D. VAUGHAN, *Asst. Photographer*

*Assistant Chief Chemist in interim of absence of Chief Chemist.

Consultants: *Ceramics*, CULLEN W. PARMELEE, M.S., D.SC., *and* RALPH K. HURSH, B.S., *University of Illinois*
Mechanical Engineering, SEICHI KONZO, M. S., *University of Illinois*

Topographic Mapping in Cooperation with the United States Geological Survey.
This report is a contribution of the Mineral Economics Section.

November 1, 1945

CONTENTS

CONTENTS—Continued

ILLUSTRATIONS

TABLES

TABLES—Continued

TABLES—Concluded

ILLINOIS MINERAL INDUSTRY IN 1944

BY

Walter H. Voskuil and Douglas F. Stevens

INTRODUCTION

The Illinois mineral industry is a key factor in creating and supporting the industrial activity in Illinois and, to considerable extent, in other states of the Upper Misssissippi Valley. The primary materials of industrial production—fuels and iron ore, the latter from the Lake Superior district—are available in abundant quantities and are assembled for processing at a low cost on Lake Michigan near the large market of Chicago and of smaller cities in the industrial belt. There are abundant cheaply mined and good quality coals at points accessible to manufacturing centers. In addition to this, certain minerals essential to the processing of primary steel, such as refractory materials and fluxes, are also present in the area, together with a variety of mineral products for foundry, chemical, construction, and other uses.

This wide array of manufacturing industries lies in the center of one of the most efficient and low-cost food producing areas in the United States, if not in the world. A fertile soil has provided an area of high food yields, a mechanized agriculture has brought production costs down to a low level, a flat topography has aided in the introduction of cost-saving farm machinery and the low cost of transporting farm products to consuming centers, and the use of power on farms, by displacing animal power, has added millions of acres to the farm land available for the production of food.

The unusual and excellent endowment of industrial, mineral, and agricultural resources offers opportunities for production and employment that are probably unmatched elsewhere.

Acknowledgments

This report is made possible through the cooperation of the Bureau of Mines and the Bituminous Coal Division of the United States Department of the Interior, the Illinois State Department of Mines and Minerals, and the cooperation of mineral producers throughout Illinois in furnishing information regarding their operation.

Each of the sections of this report was prepared in close collaboration with the heads of the several mineral research divisions of the Illinois State Geological Survey. Special assistance and advice were contributed by Ralph E. Grim, Petrographer and Principal Geologist in charge of the Geological Resources Section; G. H. Cady, Senior Geologist and Head of the Coal Division; A. H. Bell, Geologist and Head of the Oil and Gas Division; J. E. Lamar, Geologist and Head, and Robert M. Grogan, Associate Geologist, of the Industrial Minerals Division; and G. C. Finger, Chemist and Head of the Fluorspar Division of the Geochemistry Section.

Line No.	Material	Unit	Detail table	1942				
				Quantity	Value at plants		Rank among states	
					Total	Av.	Amt.	Value
1	*Coal—bituminous*	Tons	9, 11	65,746,204	*$125,575,000	*$1.91	3	4
	Petroleum—							
2	Crude oil	Bbls.	32	106,391,000	144,800,000	1.36	5	4
3	Natural gas	M. cu. ft.	"	26,129,000	948,000	.036	15	15
4	Natural gasoline	Gals.	"	66,389,000	3,252,000	.049	8	5
5	Liquefied petroleum gases	"	"	72,934,000	2,000,000	.027	4	4
6				—	151,000,000	—		
	Stone, rock products—							
7	Limestone, dolomite, marl	Tons	41, 42	14,006,556	13,014,429	.93	4	3
8	Cement	Bbls.	48	7,087,400	10,284,111	1.45	10	10
9	Lime	Tons	49	314,077	2,266,152	7.21	6	5
10	Mineral wool	—	50	—	—	—		
11	Ganister, sandstone	Tons	51	* 2,948	* 9,376	*3.18		
12				—	* 25,574,068	—		
	Clays, clay products—							
13	Clays (except fuller's earth)	Tons	52	177,663	439,872	2.48	7	13
14	Fuller's earth	"	"	30,421	264,611	8.70	4	4
15	Clay products—refractories	"	53	275,456	5,918,118	21.48		
16	Structural	Equiv. tons	"	1,135,167	6,326,510	5.57		4
17	White wares and pottery	—	"	—	7,379,387	—		
18				—	20,328,498	—		
	Sand and gravel—							
19	Silica sand	Tons	55	3,103,897	4,055,602	1.31	1	1
20	Ground silica	"	56	166,303	1,122,756	6.79	1	1
21	Other sand	"	58	5,469,306	2,627,665	.48		
22	Gravel	"	"	9,350,636	4,831,864	.52		
23	Tripoli ("amorphous" silica)	"	57	12,575	203,390	16.17	1	1
24				18,102,717	12,841,277	.71	*3	4
25	*Fluorspar*	Tons	66	161,949	4,306,750	26.59	1	1
	Metals—							
26	Zinc	Tons	68	9,389	1,746,354	186.00	17	17
27	Lead	"	"	2,344	314,096	134.00	14	14
28	Silver	Troy oz.	"	104	74	.71	22	22
29				—	2,060,524	—		
30	*Miscellaneous minerals*	Tons	69	* 34,179	* 149,327	* 4.37		
31	*Annual mineral production*			—	*$341,835,444	—		5
	Minerals processed, but mostly not mined, in Illinois[c]							
32	Coke and byproducts	—	28, 70	—	* 38,198,000	—	6	5
33	Packaged fuel	Tons	27, 70	4,980	60,001	12.05	7	7
34	Pig iron	"	70	5,871,858	125,662,134	21.30	4	4
35	Sulfuric acid	"	"	215,494	2,036,418	9.45		
36	Slab zinc (out-of-state ore)	"	"	166,066	* 30,888,246	*186.00	2	2
37	Miscellaneous minerals processed	"	"	42,849	2,436,135	56.85		
38	*Total minerals processed*			—	*199,280,934	—		
39	*Total minerals produced and processed*			—	*$541,116,378	—		

* Revised figures.
[a] Compiled from various sources, as stated in each detailed table. See footnotes for each table.
[b] Estimated for 1944.

ILLINOIS, SOLD OR USED BY PRODUCERS, 1942–1944[a]

1943					1944					
Quantity	Value at plants		Rank among states		Quantity	Value at plants		Percent change in amount from 1943	Rank among states		Line No.
	Total	Av.	Amt.	Val.		Total	Av.		Amt.	Value	
73,344,761	*$156,224,000	* $2.13	3	4	77,400,031	$164,862,000	$2.13	+ 5.5	3	4	1
82,260,000	* 112,700,000	* 1.37	6	6	77,413,000	106,055,800	1.37	— 5.9	6	6	2
* 32,544,000	* 1,545,000	* .047			[b]30,600,000	[b] 1,530,000	[b] .05	— 6.0	[c]	[c]	3
* 71,737,000	* 4,072,000	* .057	*6	*4	64,500,000	3,483,000	.054	—10.1			4
113,750,000	* 3,358,000	* .029	4	4	136,000,000	3,400,000	.025	+19.6			5
—	* 121,675,000	—			—	114,468,800	—	[d]— 5.9			6
* 11,420,135	* 10,646,658	.93	3	3	10,655,814	10,677,101	1.00	— 6.7			7
* 4,587,442	7,094,207	* 1.55	11	11	3,641,285	5,662,035	1.50	—20.6			8
* 385,854	* 2,436,423	6.31	6	5	280,935	2,183,063	7.77	—27.2			9
—	* 2,426,339	—			—	1,707,020	—	[d]—29.6			10
* 1,045	* 6,557	* 6.27			548	4,774	8.70	—47.6			11
—	* 22,610,184	—			—	20,233,993	—	[d]—10.5			12
182,620	463,986	2.54	6	7	188,604	500,113	2.65	+ 3.3			13
* 39,500	* 372,024	* 9.42	3	4	42,277	390,346	9.23	+ 7.0			14
260,362	5,379,492	20.66			200,021	4,053,387	20.26	—23.2			15
830,100	4,515,300	5.44			727,483	4,196,064	5.77	—12.4			16
—	7,359,559	—			—	6,764,620	—	[d]— 8.1			17
—	* 18,090,361	—			—	15,904,530	—	[d]—12.1			18
* 3,613,744	* 5,000,482	* 1.38			3,331,185	4,642,979	1.39	— 7.8			19
173,854	1,218,769	7.01	1	1	156,353	1,076,785	6.88	—10.1			20
3,552,391	1,763,612	.50			2,938,721	1,446,165	.49	—17.4			21
* 6,684,809	* 3,298,521	.49			5,691,439	2,820,807	.50	—14.9			22
10,203	168,758	16.54	1	1	10,431	174,732	16.75	+ 2.2			23
* 14,035,001	* 11,450,142	.82	*2	3	12,128,129	10,161,468	.84	—13.6	2	2	24
198,789	6,292,789	31.66	1	1	176,259	5,954,991	33.79	—11.3	1	1	25
* 5,851	* 1,263,816	*216.00			7,482	1,676,000	224.00	+27.9			26
* 2,043	* 306,450	150.00			2,080	328,600	158.00	+ 1.8			27
* 2,153	* 1,531	0.711			[c]	—	—	—			28
—	* 1,571,797	—			—	2,004,600	—	[d]+27.5			29
* 28,199	* 117,895	* 4.18			[b] 26,000	[b] 107,400	[b] 4.12	— 7.8			30
—	*$338,032,168	—		5	—	$333,697,782	—	[d]— 1.3		5	31
—	* 43,016,000	—	6	6	—	45,250,000	—	[d]+ 5.2			32
3,081	38,445	12.48			1,837	23,037	12.55	—40.1			33
5,920,894	126,910,295	21.30	4	4	5,686,397	118,953,078	21.00	— 4.0			34
* 259,302	* 2,481,520	* 9.60			[b] 240,000	[b] 2,280,000	[b] 9.50	— 7.5			35
* 215,829	* 46,619,084	*216.00			147,880	33,125,100	224.00	—31.5			36
35,855	2,872,624	80.12			35,808	2,726,163	75.29	— 0.1			37
—	* 221,937,968	—			—	202,357,378	—	[d]— 8.8			38
—	*$559,970,136	—			—	$536,055,160	—	[d]— 4.3			39

[c] Not available where not given.
[d] Percent change in value from 1943.
[e] Other processed minerals produced in Illinois include pig lead, expanded vermiculite, alumina, phosphates, etc., but data for them are not available.

SUMMARY OF PRODUCTION AND VALUE OF ILLINOIS MINERALS IN 1944

The mineral industry of Illinois in 1944 continued at a high rate of production. The total value of minerals produced during the year amounted to $333,697,782 as valued at the mine, quarry, or pit. This was a decrease of $4,334,386 less than the 1943 production. The additional value of $202,357,378 for mineral materials processed, but not mined, in Illinois brought the total value of all minerals produced and processed during 1944, for which data are available, to $536,055,160. This was a decrease of $23,914,976 from the all-time high record established in 1943.

A summary of the production and value of Illinois minerals in 1944 is presented in table 1, with comparative data for 1942 and 1943. Detailed figures for each mineral are given in the various sections of this report, to which reference is made in table 1.

The unit of quantity measurement used for each mineral product is that commonly used in the commercial handling of that material. Wherever possible the net or short ton of 2,000 pounds is used, but some products are sold by the gallon, barrel, cubic foot, or by the number of pieces. In some materials, diversity of products makes it impossible to give any measure of quantity.

The value of each mineral product, in its first marketable form, is given as its net selling price at point of origin, without including any transportation expense other than that necessary in bringing it from the mine to the place where it is made into a marketable product. Wherever possible, average or unit rates of value are given. The quantity and value of metals are given, not as those of the ores, but in terms of the recovered metals.

Mineral production is considered as those minerals or mineral materials which are mined and sold or used by producers in Illinois. Mineral materials which were processed, but not mined, in Illinois are shown separately. Every effort has been made to avoid duplication.

Illinois has attained a position of importance among the various states in the production of several mineral materials. Its rank both in quantity and value of these materials is given in table 1. Mineral products provided approximately 50 percent of the tonnage handled by Illinois railroads.

In order to permit comparison of recent mineral production with that in previous years, figure 1 and table 2 are presented, which show the value of annual mineral production of Illinois from 1914 to 1944, inclusive.

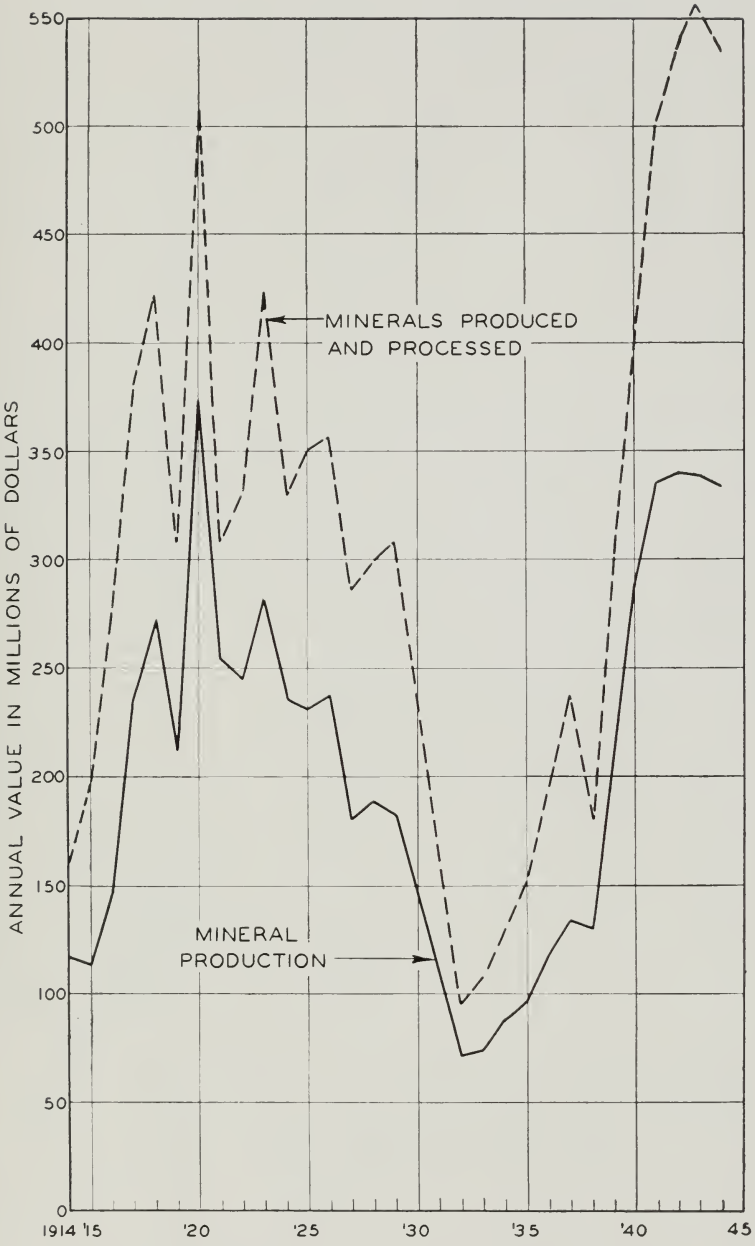

FIG 1.—Value of annual mineral production in Illinois, 1914–1944.

TABLE 2.—VALUE OF ILLINOIS MINERAL PRODUCTION
SUMMARY OF ANNUAL VALUES, 1914–1944[a]
(In thousands of dollars)

Year	Mineral production of Illinois (thousands)	Minerals processed, but not mined, in Illinois (thousands)	Total minerals produced and processed (thousands)
1914	$117,166	$ 44,843	$162,009
15	114,446	82,871	197,317
16	146,360	130,082	276,442
17	234,736	144,754	379,490
18	271,244	149,740	420,984
19	213,701	95,077	308,778
1920	373,926	137,228	511,154
21	254,019	54,136	308,155
22	244,618	85,820	330,438
23	282,761	142,131	424,892
24	235,796	95,506	331,302
1925	231,658	118,702	350,360
26	237,242	119,642	356,884
27	180,394	105,099	285,493
28	188,099	110,622	298,721
29	182,791	125,516	308,307
1930	148,311	89,303	237,614
31	108,066	52,014	160,080
32	71,693	24,385	96,078
33	74,837	34,786	109,623
34	89,212	41,405	130,617
1935	96,484	57 038	153,522
36	117,916	78,693	196,609
37	133,437	104,359	237,796
38	130,155	50,482	180,637
39	215,157	86,324	301,481
1940	287,327	114,814	402,141
41	333,225	168,338	501,563
42	*341,835	*199,281	*541,116
43	*338,032	*221,938	*559,970
44	333,698	202,357	536,055

* Revised figures.

[a] Compiled from following sources:
For years 1914-1922, Incl.—U. S. Geological Survey, Mineral Resources of United States.
1923-1931, " —U. S. Bur. Mines, Mineral Resources of United States.
1932-1938, " —U. S. Bur. Mines, Minerals Yearbooks.
1939-1944, " —Joint canvasses made by Illinois Geological Survey and U. S. Bureau of Mines, and from Minerals Yearbooks.

COAL

Coal in 1944—The National Picture

Under the stimulus of the war effort, coal production in the nation rose to a high level of 620,000,000 tons of bituminous coal and 63,701,363 tons of anthracite. This is an all-time high in coal production, approached only in 1918 when the output was 579,385,820 tons for bituminous coal and 98,826 tons for anthracite.

Figures for bituminous coal production since 1938 are shown in table 3.

Table 3.—National Bituminous Coal Output Since 1938[a]

	Tonnage output in thousands	Percent increase by years
1938	348,545	
1939	394,855	+13.3
1940	460,772	+16.7
1941	514,149	+11.6
1942*	582,693	+13.3
1943*	590,177	+ 1.3
1944	620,000	+ 5.0

* Revised figures.
[a] Compiled from U. S. Bur. Mines, Minerals Yearbooks, 1939-1943. U. S. Bur. Mines Weekly Coal Report No. W.C.R. 1442, March 10, 1945. Does not include mines with annual production of less than 1,000 tons each.

Production by Districts

Coal production by districts is shown in table 4 for three years—1942, 1943, and 1944. Of particular interest are districts east of the Mississippi River which produced 92.10 percent of the bituminous coal output. Districts No. 5 in Michigan and No. 7 in southern West Virginia lost in tonnage over the previous year. All other districts in price area No. 1 gained in tonnage output but showed a loss in percentage. On the other hand, gains in both tonnage and percentage were registered in Illinois, Indiana, and western Kentucky.

Mines in districts 7 and 8 worked practically to capacity in 1944 in an effort to supply coking coal requirements of the iron and steel industry. As a consequence, the all-rail movement of coal westward from these districts declined in spite of a general increase in coal demand. (See table 12.)

Although competition among producing districts in price areas is keen, there is a certain degree of market specialization among the several districts, based mainly on the characteristics of the product.

Districts 2, 7, and 8 supply coking coal for the blast furnaces and also a high percentage of fuel used for domestic heating. These two markets are, in a sense, complementary. Coal suitable for coking is also excellent for domestic fuel. The small sizes and screenings are therefore absorbed by the coking coal market and the prepared sizes find a ready outlet for domestic fuel over a large area.

Districts 3, 4, 6, and 9 market one-third or more of their output as railroad fuel, whereas the remaining districts distribute their output among manufacturing industries, utilities, railroads, and retail yards.

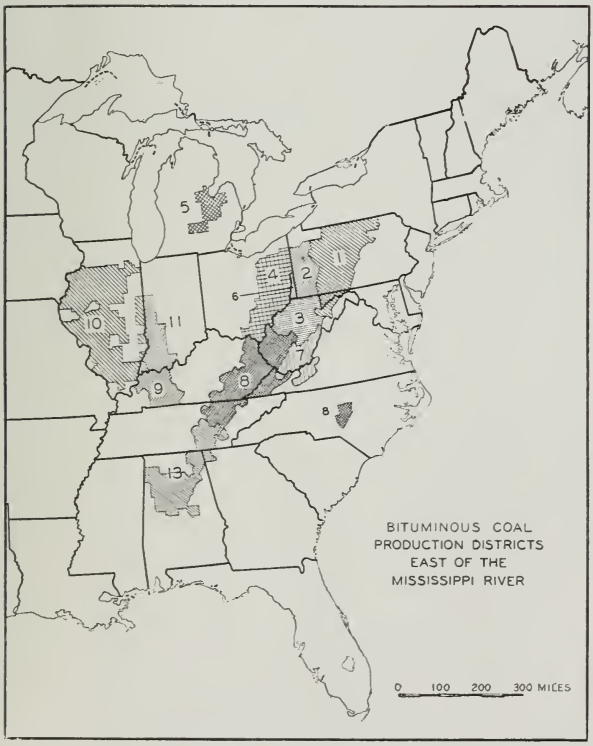

Fig. 2.—Bituminous coal production districts east of the Mississippi River.

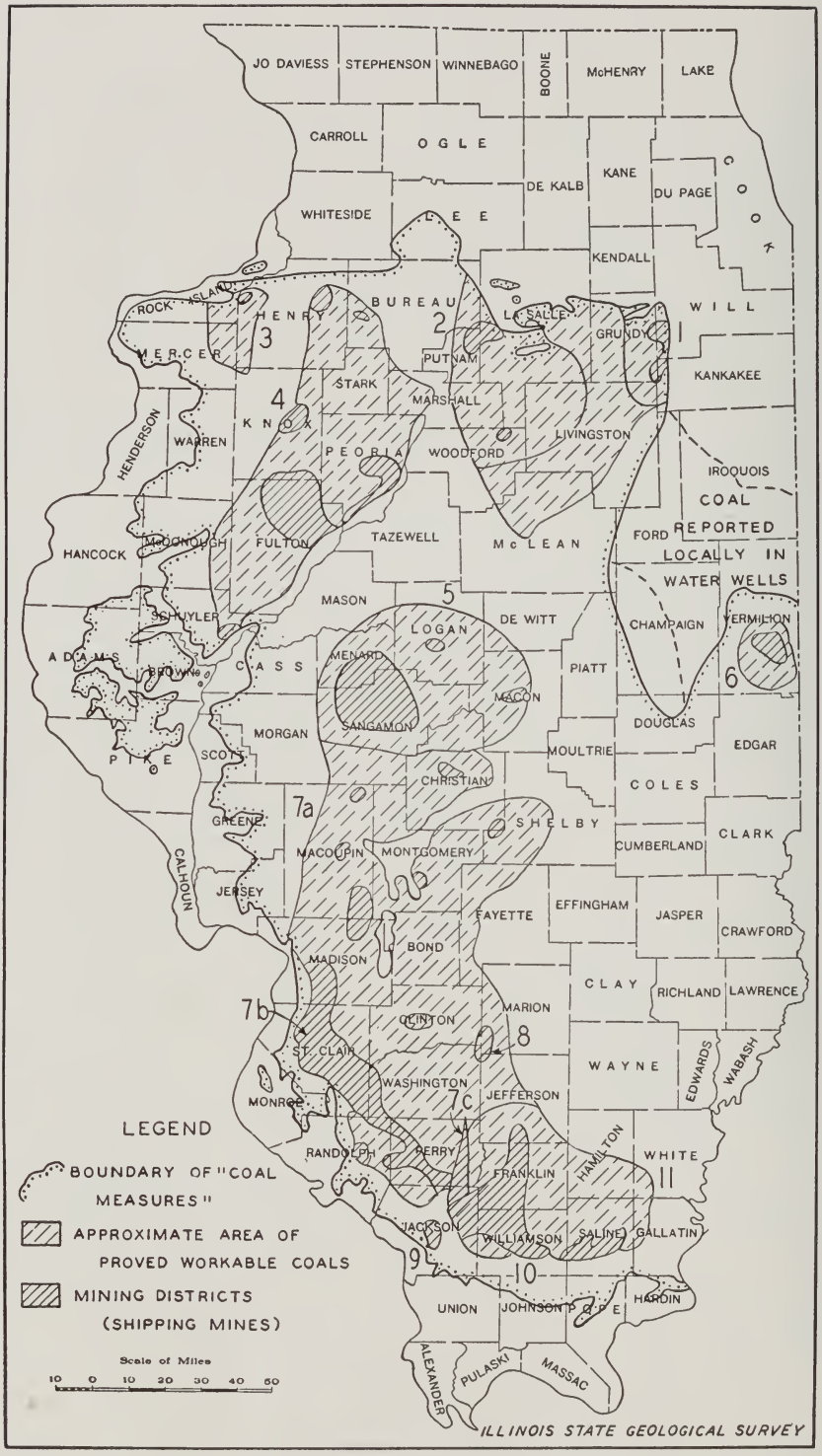

FIG. 3.—Map of Illinois showing location of principal coal mining districts and coal beds mined (see p. 17).

TABLE 4.—BITUMINOUS COAL AND LIGNITE, PRODUCTION BY DISTRICTS, 1942–1944
(In thousands of tons)

	1942[a]		1943[b]		1944[c]	
	Amount	Percent of total	Amount	Percent of total	Amount	Percent of total
Price Area 1						
Dist. 1. Eastern Pennsylvania	58,164	9.98	59,245	10.04	62,094	10.01
Dist. 2. Western Pennsylvania	88,853	15.25	84,643	14.34	89,542	14.44
Dist. 3. Northern West Virginia	38,883	6.67	41,393	7.01	46,353	7.48
Dist. 4. Ohio	32,764	5.62	32,255	5.47	33,940	5.47
Dist. 5. Michigan	231	.04	169	.03	160	.03
Dist. 6. Panhandle	5,505	.95	5,383	.91	5,536	.89
Dist. 7. Southern Numbered 1	64,596	11.09	63,059	10.69	61,806	9.97
Dist. 8. Southern Numbered 2	121,510	20.85	122,015	20.67	124,777	20.13
Total—Price Area 1	410,506	70.45	408,162	69.16	424,208	78.42
Price Area 2						
Dist. 9. West Kentucky	13,431	2.30	15,169		18,350	2.96
Dist. 10. Illinois	65,071	11.17	72,631		76,960	12.41
Dist. 11. Indiana	25,388	4.36	25,065		28,140	4.54
Dist. 12. Iowa	2,948	.51	2,771		2,690	.43
Total—Price Area 2	106,838	18.34	115,636	19.59	126,140	20.34
Price Area 3						
Dist. 13. Southeastern	20,871	3.58	18,725	3.17	20,700	3.34
Total—All Eastern Districts	538,215		542,523		571,048	
Percent of U. S. Total		92.37		91.92		92.10
Total—United States	582,693		590,177		620,000	

[a] Revised from Chapter "Bituminous Coal and Lignite" (preprint) U. S. Bur. Mines Minerals Yearbook, 1943, with final statistics for 1942.
[b] Revised from U. S. Bur. Mines Mineral Market Report No. 1238.
[c] Figures for 1944 are preliminary, as published in U. S. Bur. Mines Weekly Coal Report No. 1442. Mines with annual production less than 1,000 tons each are not included.

PRINCIPAL COAL MINING DISTRICTS AND THE PRINCIPAL COAL BEDS MINED
(See Fig. 3)

Map. No.	Mining District		Coal Beds Mined
1	Wilmington	Longwall	LaSalle (No. 2)
2	LaSalle, or Third Vein	Longwall	LaSalle (No. 2)
3	Rock Island-Mercer (abandoned)		Rock Island (No. 1)
4	Fulton-Peoria		Herrin (No. 6)
	Fulton-Peoria		Springfield (No. 5)
5	Springfield		Springfield (No. 5)
6	Danville		Danville (No. 7)
	Danville		Grape Creek
7	Southwestern Illinois		
	a) Standard		Herrin (No. 6)
	b) Belleville		Herrin (No. 6)
	c) DuQuoin		Herrin (No. 6)
8	Centralia		Herrin (No. 6)
9	Murphysboro or Big Muddy (abandoned)		Murphysboro
10	Franklin-Williamson		Herrin (No. 6)
	Franklin-Williamson		Harrisburg (No. 5)
11	Saline County		Herrin (No. 6)
	Saline County		Harrisburg (No. 5)

TABLE 5.—PRODUCTION IN DISTRICTS WITH LARGE ALL-RAIL SHIPMENTS TO THE UPPER MISSISSIPPI VALLEY, 1941–1944[a]
(In thousands of tons)

	Districts 7 and 8 West Virginia, Kentucky, Virginia		Districts 9, 10, 11 Illinois, Indiana, Western Kentucky		Illinois	
	Amount	Index	Amount	Index	Amount	Index
1941	169,148	100	88,934	100	54,703	100
1942	184,279	109	102,460	116	63,750	117
1943	183,711	109	113,015	127	72,430	133
1944	186,583	110	123,450	139	76,960	139

[a] Compiled from U. S. Bur. Mines Weekly Coal Reports. Does not include mines with annual production less than 1,000 tons each.

TABLE 6.—BITUMINOUS COAL PRODUCTION IN THE UNITED STATES, BY STATES, 1940–1944[a, b]
(In thousands of tons)

	1940	1941*	1942*	1943*	1944
Alabama	15,324	15,464	19,301	17,160	18,955
Alaska	174	239	261	289	352
Arkansas and Oklahoma	3,100	3,345	4,372	4,556	4,710
Colorado	6,589	6,949	8,086	8,324	8,110
Georgia and North Carolina	42	40	31	14	21
Illinois[a]	51,872	55,366	65,746	73,345	77,400
Indiana	18,869	22,484	25,388	25,065	28,140
Iowa	3,231	2,939	2,948	2,771	2,690
Kansas and Missouri	6,676	7,153	7,750	7,747	8,140
Kentucky:					
Eastern	40,346	42,130	48,800	48,042	49,887
Western	8,795	11,580	13,431	15,169	18,350
Maryland	1,503	1,701	2,001	1,933	1,960
Michigan	410	311	231	169	160
Montana	2,867	3,254	3,829	4,833	4,880
New Mexico	1,111	1,251	1,669	1,851	1,795
North and South Dakota	2,284	2,380	2,591	2,500	2,520
Ohio	22,772	29,319	32,764	32,255	33,940
Pennsylvania (bituminous)	116,603	130,240	144,073	141,050	148,800
Tennessee	6,008	7,045	8,158	7,179	7,400
Texas	621	353	304	153	130
Utah	3,576	4,077	5,517	6,666	7,120
Virginia	15,348	18,441	20,136	20,280	19,900
Washington	1,650	1,841	1,953	1,528	1,515
West Virginia:					
Southern	126,438	140,250	155,882	158,804	11,080
Northern					52,765
Wyoming	5,808	6,646	8,133	9,155	9,665
Other States[c]	17	15	13	53	15
Total	462,034	514,813	583,368	590,891	620,440

* Revised figures.

[a] Compiled from the following sources:
For Illinois—Illinois Department of Mines and Minerals, Annual Coal Reports.
For all other states—1939-1943, inclusive, U. S. Bur. Mines, Minerals Yearbooks, 1944, and Weekly Coal Report, No. W.C.R. 1442, March 10, 1945.
Figures for Illinois include production of all mines. Those for other states exclude mines having annual production of less than 1,000 tons each. Production of small mines in Illinois is included in "Total" in this table.

[b] Includes lignite.

[c] The states reporting are not identical from year to year.

Table 7.—Production of Bituminous Coal in the Eastern Interior Coal Field, 1939–1944[a]
(In thousands of tons)

Year	Illinois		Indiana		West Kentucky		Total
	Amount	Percent[b]	Amount	Percent[b]	Amount	Percent[b]	
1939	46,783	65.0	16,943	23.5	8,291	11.5	72,017
1940	50,610	65.3	18,869	24.1	8,795	11.2	78,274
1941	54,703	61.5	22,484	25.3	11,747	13.2	88,934
1942	*65,071	62.6	*25,388	24.5	*13,431	12.9	*103,890
1943	*72,631	64.3	*25,065	22.2	*15,169	13.5	*112,865
1944	76,960	62.4	28,140	22.8	18,350	14.8	123,450

* Revised figures.
[a] Compiled from U. S. Bur. of Mines Minerals Yearbooks, 1939-1943 and Weekly Coal Report No. 1442, March 10, 1945. Does not include mines with annual production of less than 1,000 tons each. Figures for years 1913-1938 are found in Report of Investigations No. 94, page 17, table 4.
[b] Percent of total in Eastern Interior coal field.

Table 8—Illinois Coal Production, by Quarters for the Years 1941–1944[a]
(In thousands of tons)

	1941		1942[b]		1943[c]		1944[d]	
	Amount	Percent of total	Amount	Percent of total	Amount	Percent of total	Amount	Percent of total
January-March	16,480	30.12	16,783	25.79	18,819	25.91	20,895	27.15
April-June	8,637	15.79	15,343	23.58	15,755	21.69	19,078	24.79
July-September	13,965	25.53	15,438	23.73	19,405	26.72	18,170	23.61
October-December	15,621	28.56	17,507	26.90	18,652	25.68	18,817	24.45
Total	54,703	100.00	65,071	100.00	72,631	100.00	[e]76,960	100.00

[a] Compiled from U. S. Bur. Mines Weekly Coal Reports. Does not include mines with annual production less than 1,000 tons each.
[b] Revised from Chapter "Bituminous Coal and Lignite" (preprint), U. S. Bur. Mines Minerals Yearbook, 1943.
[c] Revised from U. S. Bur. Mines Mineral Market Report 1238.
[d] Preliminary report published in U. S. Bur. Mines Weekly Coal Report No. 1441.
[e] There is a discrepancy between figures used for Illinois in this table and in tables 4, 5, and 7, which were taken from the U. S. Bur. of Mines preliminary report for 1944, and those used in other tables which were taken from figures from the Illinois Dept. of Mines and Minerals Annual Coal Report for 1944.

Shipments from the principal competitors of Illinois coal fields are shown in table 5.

Production of coal by states, for the years 1940-1944, is shown in table 6.

Coal in Illinois

Table 7 shows the coal production for the years 1939–1944 inclusive in the Eastern Interior basin. The production history of these three competitive districts and the contribution of each to the total production of the Eastern Interior basin from 1913 to 1942 is shown in table 4 of Report of Investigations No. 94, page 17.

The coal industry of Illinois continued to play an important role in the war effort through 1944. During the war years, Illinois mines not only contributed an increase of tonnage but they increased their percentage of the national output. These increases for the years 1942-44 are estimated at 25,000,000 tons above the normal peace time ratio of the national total. In some instances it has had the effect of drawing severely upon developed reserves. The increase in tonnage and percentage for the years 1941 to 1944 is shown in table 8.

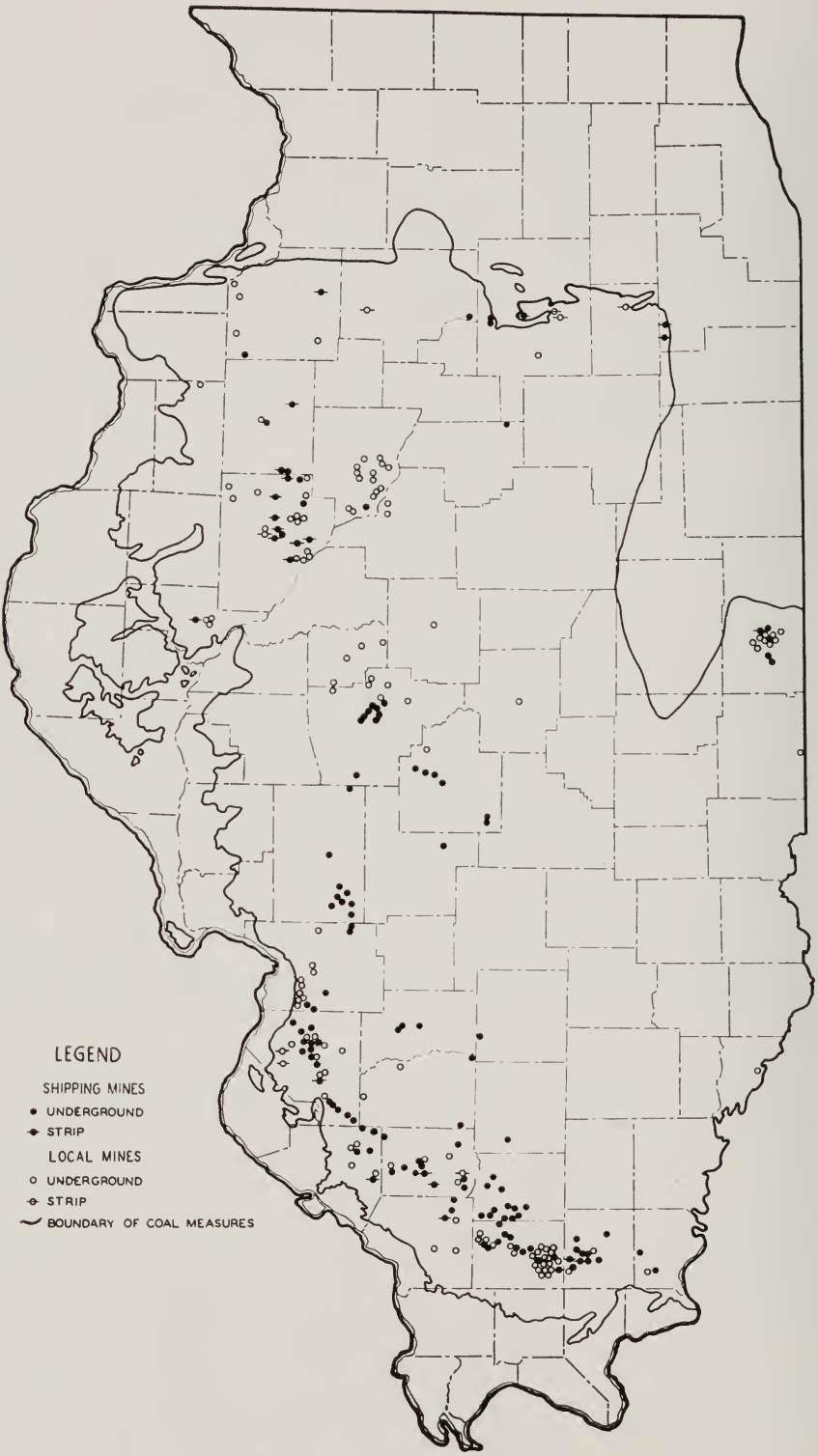

Fig. 4.—Map of Illinois showing location of shipping coal mines and local mines that had an annual production of 5,000 tons or more in 1943.

TABLE 9.—SUMMARY OF COAL PRODUCTION OF ALL ILLINOIS MINES[a]
(Detailed Table 9 on pages 22-23)

	1943		1944		Percent change in amount from 1943
	Number of mines[b]	Tons	Number of mines[b]	Tons	
Strip mines:					
Shipping	26	15,484,712	30	17,108,528	+11.1
Local	22	1,313,727	18	967,594	—26.4
	48	16,798,439	48	18,076,122	+ 7.6
Underground mines:					
Shipping	116	53,486,909	[c]135	56,850,395	+ 6.3
Local	326	3,059,413	224	2,473,514	—19.2
Total	442	56,546,322	[c]359	59,323,909	+ 4.9
Totals	[c]489	73,344,761	406	77,400,031	+ 5.5

[a] Compiled from Illinois Dept. Mines and Minerals, Sixty-third Annual Coal Report, 1944.
[b] Number of mines reporting production.
[c] One mine operated both strip and underground.

The heavy demands upon the producing districts in the Eastern Interior coal basin grew out of the restraints imposed upon shipments from districts Nos. 7 and 8 in West Virginia and eastern Kentucky in an effort to meet industrial fuel requirements in the eastern states. Again, as in 1942 and 1943, there was sustained mining activity in Illinois during the summer months (table 8).

DATA BY TYPE OF MINE

Illinois coal production for 1944 is shown in table 9 by type of mine, giving counties and mine inspection districts. Local mines are defined as those which do not ship coal by rail. Table 11 summarizes the same data for the decade 1935–1944.

TABLE 10.—PRODUCTION OF BITUMINOUS COAL IN ILLINOIS AND THE UNITED STATES, BY MONTHS, 1944[a]
(In thousands of tons)

Month	United States	Illinois	
		Amount	Percent[b]
January	54,102	7,078	13.08
February	52,817	6,821	12.72
March	54,880	6,996	12.75
April	49,510	6,163	12.45
May	53,930	6,475	12.01
June	52,712	6,440	12.22
July	48,986	5,860	11.97
August	54,177	6,499	11.91
September	50,480	5,811	11.51
October	51,813	6,319	12.39
November	50,819	6,158	12.12
December	45,774	6,340	13.85
	620,000	76,960	
Small mines and undistributed in Illinois[c]	440	440	
Total	620,440	[d]77,400	[e]12.37

[a] U. S. Bur. Mines, Weekly Coal Report No. W.C.R. 1441, March 3, 1945; W.C.R. 1442, March 10, 1945.
[b] Percent of U. S. total production.
[c] Mines with annual production less than 1,000 tons each.
[d] Illinois Dept. Mines and Minerals, Annual Coal Report, 1944.
[e] Average.

TABLE 9.—COAL PRODUCTION OF ALL ILLINOIS MINES, (In

Mine Inspection District	County	SHIPPING MINES					
		Strip		Underground		Total	
		No. of mines[b]	Tons	No. of mines[b]	Tons	No. of mines[b]	Tons
1	Bureau	—	—	1	19,543	1	19,543
4	Christian	—	—	7	7,880,902	7	7,880,902
13	Clinton	—	—	3	366,843	3	366,843
5	Edgar	—	—	—	—	—	—
10	Franklin	—	—	13	18,173,694	13	18,173,694
3	Fulton	11	6,373,429	3	191,064	14	6,564,493
11	Gallatin	—	—	1	46,053	1	46,053
7	Greene	—	—	—	—	—	—
1	Grundy	—	—	—	—	—	—
3	Henry	1	94,408	1	523,436	2	617,844
9	Jackson	1	583,115	[c]3	2,417,266	3	3,000,381
13	Jefferson	—	—	1	478,034	1	478,034
7	Jersey	—	—	—	—	—	—
3	Knox	2	1,939,780	2	114,345	4	2,054,125
1	LaSalle	1	114,324	2	112,367	3	226,691
1	Livingston	—	—	—	—	—	—
2	Logan	—	—	—	—	—	—
14	McDonough	—	—	—	—	—	—
4	Macon	—	—	—	—	—	—
6	Macoupin	—	—	9	5,518,050	9	5,518,050
7	Madison	—	—	5	1,804,199	5	1,804,199
13	Marion	—	—	1	302,274	1	302,274
1	Marshall	—	—	—	—	—	—
4	Menard	—	—	—	—	—	—
14	Mercer	—	—	—	—	—	—
6	Montgomery	—	—	1	982,346	1	982,346
2	Peoria	—	—	1	331,117	1	331,117
9	Perry	2	2,766,485	8	1,835,861	10	4,602,346
9	Randolph	1	1,057,048	7	1,608,649	8	2,665,697
14	Rock Island	—	—	—	—	—	—
8	St. Clair	1	273,564	15	1,891,872	16	2,165,436
11	Saline	2	573,256	10	3,917,185	12	4,490,441
4	Sangamon	—	—	9	2,761,786	9	2,761,786
14	Schuyler	2	235,508	—	—	2	235,508
2	Stark	—	—	—	—	—	—
2	Tazewell	—	—	—	—	—	—
5	Vermilion	1	30,463	5	2,248,596	6	2,279,059
14	Warren	—	—	—	—	—	—
13	Washington	—	—	2	525,688	2	525,688
1	Will	2	1,779,552	—	—	2	1,779,552
12	Williamson	3	858,568	24	3,206,931	27	4,065,499
2	Woodford	—	—	1	21,322	1	21,322
	Number of mines	30		[c]135		164	
	Total produced—1944		17,108,528		56,850,395		73,958,923

[a] Compiled from Illinois Dept. Mines and Minerals, Sixty-third Annual Coal Report, 1944.
[b] Number of mines reporting production.
[c] One mine reported both strip and underground operations.

BY TYPE OF MINE, AND BY COUNTIES, 1944[a]
tons)

LOCAL MINES						COUNTY TOTAL			Mine Inspection District
Strip		Underground		Total					
No. of mines[b]	Tons	No. of mines[b]	Tons	No. of mines[b]	Tons	No. of mines[b]	Tons	Percent of State total	
1	100,920	—	—	1	100,920	2	120,463	.16	1
—	—	1	15,332	1	15,332	8	7,896,234	10.22	4
—	—	—	—	—	—	3	366,843	.47	13
—	—	2	41,408	2	41,408	2	41,408	.05	5
—	—	—	—	—	—	13	18,173,694	23.22	10
—	—	29	201,645	29	201,645	43	6,766,138	8.73	3
—	—	6	23,200	6	23,200	7	69,253	.09	11
—	—	1	42	1	42	1	42	—	7
1	30,237	—	—	1	30,237	1	30,237	.04	1
—	—	5	51,645	5	51,645	7	669,489	.86	3
1	1,700	4	24,774	5	26,474	8	3,026,855	3.92	9
1	23	—	—	1	23	2	478,057	.62	13
—	—	1	32	1	32	1	32	—	7
—	—	3	78,665	3	78,665	7	2,132,790	2.75	3
3	6,014	1	22,893	4	28,907	7	255,598	.33	1
2	2,899	1	234	3	3,133	3	3,133	—	1
—	—	2	52,338	2	52,338	2	52,338	.07	2
—	—	4	773	4	773	4	773	—	14
—	—	1	38,167	1	38,167	1	38,167	.05	4
—	—	—	—	—	—	9	5,518,050	7.11	6
—	—	10	310,433	10	310,433	15	2,114,632	2.72	7
—	—	—	—	—	—	1	302,274	.39	13
1	800	3	1,053	4	1,853	4	1,853	—	1
—	—	7	46,791	7	46,791	7	46,791	.06	4
—	—	2	1,377	2	1,377	2	1,377	—	14
—	—	—	—	—	—	1	982,346	1.27	6
—	—	33	293,034	33	293,034	34	624,151	.81	2
1	19,200	5	27,935	6	47,135	16	4,649,481	6.00	9
—	—	4	29,745	4	29,745	12	2,695,442	3.78	9
—	—	3	1,941	3	1,941	3	1,941	—	14
2	796,133	12	153,867	14	950,000	30	3,115,436	4.02	8
—	—	6	13,707	6	13,707	18	4,504,148	5.81	11
—	—	8	149,226	8	149,226	17	2,911,012	3.76	4
1	200	10	21,408	11	21,608	13	257,116	.32	14
—	—	4	809	4	809	4	809	—	2
—	—	3	128,223	3	128,223	3	128,223	.17	2
3	8,968	20	155,155	23	164,123	29	2,443,182	3.16	5
—	—	1	4,313	1	4,313	1	4,313	.01	14
—	—	2	9,671	2	9,671	4	535,359	.70	13
—	—	—	—	—	—	2	1,779,552	2.30	1
1	500	30	573,678	31	574,178	58	4,639,677	6.00	12
—	—	—	—	—	—	1	21,322	.03	2
18	967,594	224	2,473,514	242	3,441,108	406	77,400,031	100.00	

Summary given on page 21.

TABLE 11.—AMOUNT AND VALUE OF COAL PRODUCED IN ILLINOIS, SHOWING NUMBER AND TYPE OF MINES, 1935–1944[a]
(In thousands of tons, and thousands of dollars)

Year	NUMBER OF MINES[b]							PRODUCTION (thousands of tons)							VALUE AT MINES[c]	
	Shipping		Local		Total			Strip			Underground			Total production	Total (thousands of dollars)	Average per ton
	Strip	Underground	Strip	Underground	Strip	Underground	All	Shipping	Local	Total strip	Shipping	Local	Total underground			
1935...	28	154	127	1,041	155	1,195	1,350	7,135	346	7,481	34,275	3,257	37,532	45,013	$ 70,220	$1.56
1936...	30	146	86	980	116	1,126	1,242	8,873	474	9,347	38,412	3,717	42,129	51,476	79,788	1.55
1937...	31	137	70	782	101	919	1,020	11,176	550	11,726	36,886	3,820	40,706	52,432	82,318	1.57
1938...	25	124	74	746	99	870	969	10,059	620	10,679	28,384	3,324	31,708	42,387	63,581	1.50
1939...	26	120	82	748	108	868	976	11,296	990	12,286	31,698	3,643	35,341	47,627	78,108	1.64
1940...	27	112	53	696	80	808	888	12,025	1,255	13,280	34,047	3,955	38,002	51,282	86,667	1.69
1941...	29	113	29	628	58	741	799	13,361	881	14,242	37,673	3,451	41,124	55,366	100,212	1.81
1942...	28	114	30	513	58	627	* 684	14,827	1,111	15,938	*46,297	* 3,511	49,808	65,746	*125,575	* 1.91
1943...	26	116	22	326	48	442	489	15,485	1,314	16,799	53,487	3,059	56,546	73,345	*156,224	* 2.13
1944...	30	135	18	224	48	359	406	17,108	968	18,076	56,850	2,474	59,324	77,400	164,862	2.13

* Revised figures.
[a] Compiled from Illinois Dept. Mines and Minerals, Annual Coal Reports.
[b] Number of mines reporting production during year indicated.
[c] Based on total productin at average price for each year, which is derived from the following sources:
For years 1935, 1939, 1940-44 incl.—U. S. Bureau of Mines, Minerals Yearbooks, and M. M. S. 1238—Dec. 5, '44; 1935 and 1939 exclude selling costs, 1940-1944, incl., include selling costs.
For years 1936, 1937, 1938—U. S. Department of the Interior, Bituminous Coal Division, cost of production data include selling costs.

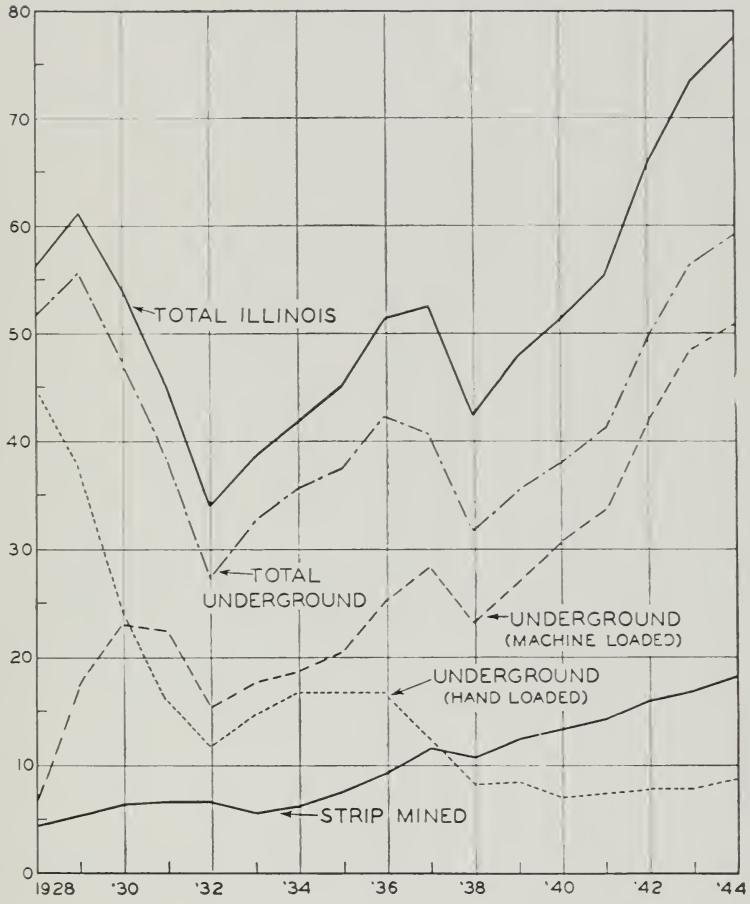

FIG. 5.—Annual production of Illinois coal, classified by mining methods, 1928–1944.

COAL DISTRIBUTION IN THE ILLINOIS COAL MARKET TERRITORY

THE MARKET AREA

Illinois supplies substantial quantities of coal to eleven states in the Upper Mississippi and Missouri valleys and minor quantities in several additional states. The principal market states are Illinois, Indiana, Michigan, Wisconsin, Iowa, Kansas, Minnesota, Missouri, Nebraska, South Dakota and Arkansas. In this same area also are marketed vast quantities of coal from West Virginia, Kentucky, Pennsylvania, Virginia, Ohio, and Indiana. This Upper Mississippi Valley is a battle ground for competing fuels from widely separated regional sources. (See table 12.)

The complex nature of the coal market in this industrial area is indicated by the diverse nature of coal requirements such as coking coal, domestic fuel, railroad and industrial fuel, the various producing districts contributing to this market, and the competing all-rail and rail-lake transportation over which the coal is delivered to these markets.

THE ALL-RAIL MOVEMENT

The all-rail movement, exclusive of railway fuel, supplied 72,000,000 tons in 1944 of which Illinois supplied approximately 43,000,000 tons (table 12). The heavy movement from eastern producing districts, particularly in West Virginia and eastern

TABLE 12.—ORIGIN AND DESTINATION OF REVENUE RAILROAD SHIPMENTS OF COAL FROM
(Exclusive of non-
(In

Origin	Destination:	Chicago District	Illinois, other[b]	Milwaukee, Wis.	Wisconsin, other	Council Bluffs, Iowa[c]	Iowa, other
			1943				
Western Pennsylvania		115,385	21,386	32	—	—	—
Central Pennsylvania, Somerset-Myersdale Cumberland-Piedmont		24,905	8,652	154	13,113	581	12,470
Fairmont, West Virginia		53,156	9,396	49	340	—	788
Northern and Eastern Ohio		1,618	820	—	1,472	—	1,393
Southern Ohio		13,989	—	379	451	—	160
Kanawha, Logan, Kenova-Thacker		2,351,381	172,296	2,662	36,191	164	174,297
New River-Winding Gulf, Pocahontas-Tug River		9,439,189	498,514	157,051	662,510	—	82,628
N. E. Kentucky, McRoberts		3,376,031	117,029	1,370	29,179	—	172,195
Virginia		338,928	45,225	905	64,745	500	13,453
Hazard, Harlan, S. Appalachians		2,698,608	469,923	307	62,142	308	596,212
Ex-river coal		12,617	—	—	—	—	—
Northern Illinois		933,613	4,915,921	652	196,708	11,965	1,609,638
Central and Southern Illinois		7,266,187	12,823,159	156,140	1,812,833	171,019	2,350,461
Indiana		3,187,672	1,407,702	242,675	757,799	27,857	499,621
Western Kentucky		961,089	424,638	778	193,776	6,730	318,271
Grand total		30,774,368	20,914,661	563,154	3,831,259	219,124	5,831,587
Percent of change from 1942		+3.1	+5.1	+10.6	+3.0	+197.7	+7.5
			1944				
Western Pennsylvania		779	29,332	—	—	—	—
Central Pennsylvania, Somerset-Myersdale, Cumberland-Piedmont		19,089	7,419	149	10,149	30	13,153
Fairmont, West Virginia		44,391	10,303	1,834	3,187	—	2,411
Northern and Eastern Ohio		6,790	485	—	—	—	—
Southern Ohio		7,956	—	—	—	—	—
Kanawha, Logan, Kenova-Thacker		2,300,417	196,177	6,932	45,844	294	176,445
New River-Winding Gulf, Pocahontas-Tug River		7,687,840	431,662	154,355	559,747	215	68,335
N. E. Kentucky		3,124,223	121,772	1,461	24,887	—	160,887
Virginia		299,815	42,168	261	59,456	—	13,766
Hazard, Harlan S. Appalachians		2,677,139	420,785	103	52,087	154	539,583
Ex-river coal		13,276	—	—	—	—	—
Northern Illinois		760,017	5,087,769	—	123,751	98	1,722,852
Central and Southern Illinois		7,498,802	14,605,898	140,221	1,876,113	112,079	2,498,736
Indiana		3,027,145	1,475,604	274,953	821,620	31,182	577,047
Western Kentucky		1,046,862	428,312	1,122	164,597	4,917	261,474
Grand total		28,514,541	22,848,686	581,391	3,741,438	148,969	6,034,689
Percent of change from 1943		−7.3	+9.2	+3.2	−4.0	−32.0	+3.5

[a] Data from U. S. Dept. Interior, Bituminous Coal Div., Solid Fuels Adm. for War, and Bureau of Mines, Monthly Coal Distribution Report No. 160.
[b] Includes Davenport, Iowa, for shipments from Ohio and the Crescent, and includes Davenport, Bettendorf, and Iowanna, Iowa, for shipments from Illinois, Indiana and Western Kentucky, excluding East St. Louis, Illinois.

Illinois, Indiana, Western Kentucky and the Appalachian Fields in 1943 and 1944[a]
revenue railroad fuel)
tons)

St. Louis, Mo.[d]	Kansas City, Mo.[e]	St. Joseph, Mo.[f]	Missouri, other	Kansas, other	Nebraska, other	Minnesota	South Dakota	North Dakota	Total	Per cent of total
				1943						
85	—	—	—	—	—	—	—	—	136,888	.2
53,181	991	389	1,377	1,718	1,074	7,804	859	—	127,268	.2
968	—	—	—	—	—	54	—	—	64,751	.1
—	—	—	—	—	—	—	—	—	5,303	—
—	—	—	—	—	—	—	—	—	14,979	—
328,877	—	—	449	—	175	13,875	438	—	3,080,805	4.3
709,201	—	—	432	57	76	131,724	6,893	—	11,688,275	16.2
456	—	—	307	—	1,015	22,429	2,118	—	3,722,129	5.2
206,278	—	—	—	—	53	7,955	803	—	678,845	.9
28,482	—	—	564	—	1,131	29,408	1,335	—	3,888,420	5.4
—	—	—	—	—	—	—	—	—	12,617	—
100	601	—	12,848	—	10,750	28,927	3,000	—	7,724,723	10.7
4,602,407	376,320	30,580	2,181,694	97,073	233,551	472,311	94,486	911	32,659,132	45.2
14,428	101	—	1,150	9,592	12,319	106,435	5,169	—	6,272,520	8.7
81,765	—	—	57,745	—	6,673	45,444	20,380	674	2,117,963	2.9
6,026,228	378,013	30,969	2,256,566	108,440	256,817	866,366	135,481	1,585	72,194,618	100.0
+7.6	+282.9	+172.4	+18.9	—32.2	+56.9	+6.6	—25.7	+104.3	+5.5	
				1944						
—	—	—	—	—	—	—	—	—	30,111	—
50,305	660	195	1,306	1,164	1,468	6,805	652	—	112,544	.2
758	54	—	—	—	—	443	—	—	63,381	.1
—	—	—	—	—	—	—	—	—	7,275	—
—	—	—	—	—	—	—	—	—	7,956	—
312,888	—	94	232	—	406	16,393	399	—	3,056,521	4.2
616,372	34	—	—	123	112	84,472	5,260	—	9,608,527	13.3
2,027	—	—	—	51	659	16,067	1,550	—	3,453,584	4.8
126,966	—	—	53	—	—	7,193	700	—	550,378	.8
23,029	—	—	665	—	1,643	25,746	1,178	—	3,742,112	5.1
—	—	—	—	—	—	—	—	—	13,276	—
—	248	—	1,054	—	20,622	26,877	11,713	—	7,746,001	10.7
5,243,887	288,140	38,494	2,275,844	89,808	241,437	577,183	108,934	573	35,596,149	49.1
13,977	2,566	—	838	500	6,639	134,873	6,272	—	6,373,216	8.8
37,474	—	—	56,251	—	2,774	43,327	15,629	1,536	2,064,275	2.9
6,427,683	291,702	38,783	2,336,243	91,646	275,760	939,379	152,287	2,109	72,425,306	100.0
+6.7	—22.8	+25.2	+3.5	—15.5	+7.4	+8.4	+12.4	+33.1	+.3	

[e] Includes Omaha and South Omaha, Nebraska.
[d] Includes East St. Louis, Illinois.
[e] Includes Kansas City, Kansas.
[f] Includes Atchison and Leavenworth, Kansas.

Kentucky, consists largely of coking coal and the large sizes of the same type of coal for use in the domestic market.

Certain changes in 1944 worthy of note are the substantial decline in shipments from the New River and Pocahontas districts in West Virginia and a corresponding increase in shipments from southern Illinois as compared with 1943.

LAKE SHIPMENTS OF COAL

The lake trade in coal in the past has been exclusively a movement of coal from Appalachian producing districts to lake port markets on Lakes Huron, Michigan, and Superior.

The data on lake shipments of coal from Appalachian fields do not specify the destinations of coal originating in each field. Some inferences regarding the destinations can be made, however, from the nature of the market. In table 13 is shown the origin of lake cargo coal in the years 1942, 1943, and 1944. As noted in this table, the bulk of the shipments comes from Pennsylvania and from the low-, medium-, and high-volatile coal districts of southern West Virginia and eastern Kentucky. Shipments from the low- and medium-volatile coal fields consist of screenings destined to the coke ovens of the Chicago district. Coal from Pennsylvania is destined to Upper Lake Michigan and Lake Superior ports, both in the prepared sizes and as screenings for domestic and industrial fuel. The heavy demand for coking coal resulting from the wartime expanded steel industry in the Chicago district caused a substantial increase in shipments of coking coal from the low-volatile coal districts in southern West Virginia in 1944. Total shipments fell off somewhat. This is explained by the heavy war requirements of eastern industries and a resultant shortage of coal (other than coking coal) for shipments to the northwest. Total receipts from Appalachian fields at upper lake ports are shown in table 14.

The reduction in freight rates on coal from mines in Illinois, Indiana and western Kentucky to Chicago for transshipment to upper lake ports, and the heavy demands of war on all coal producing districts, resulted in lake shipments from Eastern Interior fields and provided a summer load for the mines. Shipments from Illinois and western Kentucky totaled 1,062,301 tons in 1943 and 1,450,143 in 1944. Illinois contributed 909,366 tons in 1944 and western Kentucky 540,777 tons (table 15). There were no shipments from Indiana.

COAL SHIPMENTS TO TIDEWATER

A total of 188,525 tons of coal were shipped from Illinois districts to tidewater for transshipment to South American markets. This movement probably will cease after wartime demands for coal on eastern fields decline and British coal also becomes available for the export markets.

TABLE 13.—ORIGIN OF LAKE CARGO COAL FROM APPALACHIAN FIELDS, 1942–1944
(In thousands of tons)

From	1942[a]	1943[b]	1944[b]
Ohio	4,171	4,682	4,995
Pennsylvania	9,305	8,409	10,568
Moundsville, West Virginia	358	406	395
Fairmont, Cumberland, Piedmont	2,420	2,357	3,283
Southern West Virginia—low volatile	9,160	14,256	10,797
Southern West Virginia—high volatile	14,746	8,653	13,902
Eastern Kentucky, Tennessee, Virginia	9,295	8,692	11,551
Total	49,455	47,455	55,491

[a] U. S. Bur. Mines Monthly Coal Distribution Report No. 147, June 13, 1944.
[b] U. S. Bur. Mines Monthly Coal Distribution Report No. 159, April 16, 1945.

TABLE 14.—LAKE CARGO SHIPMENTS AND RECEIPTS OF COAL AT UPPER LAKE DOCKS, 1934–1944[a]
(In thousands of tons)

Year	Bituminous coal loaded into vessels at Lake Erie ports	Receipts at		Total receipts
		Lake Superior ports	Lake Michigan ports[b]	
1934..	34,869	8,023	4,535	12,558
1935..	34,730	6,829	4,043	10,872
1936..	44,011	9,358	5,114	14,472
1937..	43,645	9,115	4,822	13,937
1938..	34,173	6,614	3,758	10,372
1939..	39,837	6,515	4,229	10,744
1940..	46,548	6,991	4,436	11,427
1941..	49,733	8,356	4,830	13,186
1942..	47,815	8,108	5,068	13,176
1943..	46,059	9,455	4,982	14,437
1944..	53,981	9,417	5,277	14,694

[a] U. S. Bituminous Coal Div., Monthly Coal Distribution Reports.
[b] Ports on Lake Michigan north of Waukegan.

TABLE 15.—LAKE SHIPMENTS OF COAL FROM THE EASTERN INTERIOR BASIN, 1944[a]

Month	West Kentucky	Illinois	Total
January	.....	.....	.....
February	.....	.....	.....
March	28,624	51,316	79,940
April	52,118	89,836	141,954
May	94,566	154,430	248,996
June	99,055	173,501	272,556
July	89,226	146,128	235,354
August	84,909	183,708	268,617
September	56,100	74,412	130,512
October	28,614	36,035	64,649
November	5,462	.....	5,462
December	2,103	.....	2,103
Total	540,777	909,366	1,450,143

[a] U. S. Bur. Mines Monthly Coal Distribution Reports Nos. 149-160 inclusive.
* No shipments from Indiana.

METROPOLITAN MARKETS

Sources of coal for the two principal metropolitan markets for Illinois coal are shown in tables 16 and 17.

COAL PRICES IN 1944

Coal prices—mine, lake cargo, and retail—were subject to price ceilings imposed by the Office of Price Administration. During 1944 only minor changes occurred in mine prices of coal in those districts serving the markets of the Upper Mississippi Valley (table 18).

COAL CONSUMPTION BY STATES AND USES

The distribution of coal by states and by sizes from each producing district has been made available for the first time in 1944 by the United States Bureau of Mines and the Solid Fuels Administrator for War. Tables 19–22 provide the pertinent data for coal originating in or shipped into the Illinois coal market area.

TABLE 16.—SOURCES OF ALL-RAIL COAL DESTINED FOR CHICAGO, 1942–1944
(In tons)

	1942[a]	1943[a]	1944[b]	Percent of change 1944 from 1943
Western Pennsylvania	5,023	115,385	779	— 99.3
Central Pennsylvania, Somerset-Myersdale Cumberland-Piedmont	18,147	24,905	19,089	— 23.7
Fairmont, West Virginia	137,776	53,156	44,391	— 16.5
Northern and eastern Ohio	1,195	1,618	6,790	+ 319.6
Southern Ohio	2,433	13,989	7,956	— 43.1
Kanawha, Logan and Kenova-Thacker	2,327,548	2,351,381	2,300,417	— 2.2
New River-Winding Gulf and Pocahontas-Tug River	9,755,335	9,439,189	7,687,840	— 18.5
Northeast Kentucky and McRoberts	2,681,672	3,376,031	3,124,223	— 7.5
Virginia	283,062	338,928	299,815	— 14.5
Hazard, Harlan, and Southern Appalachian	3,341,359	2,698,608	2,677,139	— .8
Ex-river coal	41,377	12,617	13,276	+ 5.2
Northern Illinois	820,140	933,613	760,017	— 18.6
Central and southern Illinois	6,079,795	7,266,187	7,498,802	+ 3.2
Indiana	3,596,192	3,187,672	3,027,145	— 5.1
Western Kentucky	767,164	961,089	1,046,862	+ 8.9
Total	29,858,216	30,774,368	28,514,541	[c]— 7.3
Percent of Chicago total supplied by Illinois	23.1	26.6	28.9	

[a] U. S. Bur. Mines Monthly Coal Distribution Report No. 148, July 3, 1944.
[b] U. S. Bur. Mines Monthly Coal Distribution Report No. 160, April 26, 1945.
[c] Average.

TABLE 17.—SOURCES OF COAL DESTINED FOR ST. LOUIS, 1942–1944

From	1942[a]	1943[a]	1944[b]	Percent of change 1944 from 1943
Central Pennsylvania	32,660	53,266	50,305	— 11.2
Fairmont, Pa.	1,128	968	758	— 21.7
Kanawha, West Virginia	219,782	328,877	312,888	— 4.7
New River, West Virginia	640,871	709,201	616,372	— 11.7
Virginia, Northeast Kentucky	301,455	206,734	128,993	— 37.5
Hazard, Harlan	22,239	28,482	23,029	— 19.2
Illinois	4,229,879	4,602,507	5,243,887	+ 13.9
Indiana	17,115	14,428	13,977	— 3.1
Western Kentucky	135,184	81,765	37,474	— 54.1
Total	5,600,313	6,026,228	6,427,683	[c]+ 6.6
Percent of St. Louis total received from Illinois	75.5	76.4	81.6	

[a] U. S. Bur. Mines Monthly Coal Distribution Report No. 148, July 3, 1944.
[b] U. S. Bur. Mines Monthly Coal Distribution Report No. 160, April 26, 1945.
[c] Average.

TABLE 18.—COAL MINE PRICES, DECEMBER 1943 AND DECEMBER 1944[a]
(Per ton)

	December, 1943	December, 1944
Southern Illinois		
Freight rate to Chicago, $2.05 a ton		
Lump	$ 3.35	$ 3.30
Egg	3.30	3.30
Nut	2.55– 3.00	2.55– 3.00
Washed screenings	2.10– 2.35	2.40
Screenings	2.05	2.10
Mine run	2.60	2.60
Central Illinois		
Freight rate to Chicago, $1.75 a ton		
Lump	2.45– 3.00	2.45– 3.20
Egg	2.40– 2.60	2.45– 3.00
Nut	2.05– 2.50	2.35– 2.70
Washed screenings	1.75– 2.40	2.05– 2.60
Screenings	1.60– 2.10	1.75– 2.35
Mine run	2.25– 2.65	2.00– 2.65
Indiana, No. 4		
Freight rates to Chicago, $1.65 and $1.75 a ton		
Lump	2.70– 2.95	2.70– 2.95
Egg	2.60– 2.85	2.60– 2.85
Stoker nut	1.95– 2.40	1.95– 2.40
Nut	1.95– 2.40	1.95– 2.40
Screenings	1.85– 2.05	1.85– 2.05
Mine run	2.50– 2.60	2.50– 2.60
Indiana, No. 5		
Freight rates to Chicago, $1.65, $1.87, $1.90 a ton		
Lump	2.55– 3.00	2.55– 3.00
Egg	2.45– 2.60	2.45– 2.60
Stoker nut	1.85– 2.10	1.85– 2.10
Nut	2.30– 2.45	2.30– 2.45
Screenings	1.75– 1.90	1.75– 1.90
Mine run	2.40– 2.45	2.40– 2.45
West Virginia Smokeless, New River and Pocahontas		
Freight rates to Chicago, $3.39 a ton		
Lump	3.65– 4.35	3.95
Egg	3.65– 4.45	4.05
Stove	4.10– 4.15	4.10
Nut	3.40– 3.55	3.55
Stoker pea	3.35– 3.45	3.45
Mine run (Dom.)	3.70– 3.80	3.80
Straight mine run	3.45– 3.65	3.45– 3.65
Slack	2.70– 2.90	2.70– 2.90
Briquets	4.70	5.25
Eastern Kentucky, Millers Creek—Great Heart		
Freight Rate to Chicago, $3.19 a ton		
Block	4.35	4.35– 4.40
Furnace	4.35	4.35– 4.40
Small egg	3.50	
Stoker nut	4.05	4.05– 4.15
Screenings	2.70	2.90– 3.10
East Kentucky, West Virginia, High Volatile		
Freight rate to Chicago, $3.19 a ton		
Block	3.10– 3.45	3.50– 3.80
Furnace	2.75– 3.05	3.20– 3.55
Small egg	3.20	3.10
Stoker nut	3.05– 3.25	3.40– 3.80
Screenings	2.75– 2.80	

TABLE 18.—(Concluded)

	December, 1943	December, 1944
West Kentucky, No. 9 and No. 11		
Freight rate to Chicago, $2.40 a ton		
Lump, 6″	$ 2.25	$ 2.25– 2.40
Egg, 6″x3″	2.15	2.20– 2.40
Stoker nut	1.75– 1.85	1.85– 2.50
Screenings	1.35– 1.65	1.65– 1.95
Mine run	2.10	2.10– 2.30
Western Kentucky, No. 6		
Freight rate to Chicago, $2.40 a ton		
Lump, 6″	2.80	2.70
Egg, 6″x3″	2.60	2.70
Stoker nut	2.70– 3.00	3.10
Screenings	2.25– 2.45	2.45
Western Kentucky, No. 14		
Freight rate to Chicago, $2.40 a ton		
Lump, 6″	2.50	2.45
Egg, 6″x3″	2.45	2.45
Nut, 3″x2″	2.25	2.45
Chestnut	2.10	2.20
Screenings, 2″	2.05	2.00
Anthracite		
Freight rate to Chicago from mines in Pennsylvania, $4.26 a ton		
Grate, egg, stove, chestnut	8.00	7.85
Pea	6.45	6.30
Buckwheat	4.80	4.65
Rice	3.85	3.75
Coke		
F.o.b. dealers yards in Chicago, f.o.b. ovens, 75 cents a ton less		
Egg, range, nut	9.50	14.80
Pea	10.30	13.80
Foundry (at Chicago ovens)	12.30	

[a] Chicago Journal of Commerce.

TABLE 19.—COAL CONSUMED IN THE ILLINOIS COAL MARKET AREA (EXCLUSIVE OF RAILROAD FUEL), 1944[a]

	Total
Distribution of total production (all rail) from Mines in U. S.	
Illinois	41,849,010
Wisconsin	4,289,562
Iowa	6,937,902
Kansas	2,494,774
Minnesota	1,525,182
Missouri	8,045,783
Nebraska	2,271,734
North Dakota	55,037
South Dakota	468,329
Waterborne Shipments Via Lake and Tidewater Summaries by Consumer States of Destination	
Illinois	2,373,177
Wisconsin	8,637,206
Iowa	110,831
Kansas	.....
Minnesota	3,733,429
Missouri	.....
Nebraska	10,216
North Dakota	200,586
South Dakota	348,114

TABLE 19.—(Concluded)

	Total
Total Shipments to Consumers—All Movements and Uses	
Illinois	44,222,187
Wisconsin	12,926,768
Iowa	7,048,733
Kansas	2,494,774
Minnesota	5,258,611
Missouri	8,045,783
Nebraska	2,281,950
North Dakota	255,623
South Dakota	816,443
Grand Total	83,350,872

[a] U. S. Bur. Mines, Monthly Coal Distribution Report Nos. 149-160.

TABLE 20.—DISTRIBUTION OF BITUMINOUS COAL PRODUCED IN ILLINOIS, 1944[a]
(In tons)

Disposal	Amount	Disposal	Amount
All-rail, river, ex-river [b](excluding railroad fuel)		Pacific	
Total for United States	41,798,487	Washington	235
Middle Atlantic		Unspecified	24,435
Pennsylvania	171	Canada	296
East North-Central			
Illinois	26,901,642	Railroad fuel	25,278,169
Indiana	2,083,839		
Michigan	338,650	Tidewater	188,525
Ohio	684		
Wisconsin	2,282,657	Lake	909,366
West North-Central			
Iowa	4,135,399	Distributors or wholesalers (destination and use unknown)	183,129
Kansas	117,652		
Minnesota	1,104,778		
Missouri	3,964,307	Truck	5,496,338
Nebraska	282,286		
North Dakota	520	Private railways, tramways, and conveyors	122,266
South Dakota	132,421		
South Atlantic			
North Carolina	29,862	Coal used at mines	1,107,120
East South-Central			
Alabama	3,517	Net change in inventory	+23,325
Kentucky	931		
Mississippi	34,768	Total	75,107,201
Tennessee	127,895	Percentage of estimated production	97.8
West South-Central			
Arkansas	203,972		
Louisiana	27,866		

[a] Data from U. S. Bur. Mines Monthly Coal Distribution Reports Nos. 146-160, July 11, 1944—April 26, 1945.
[b] Also includes byproduct and smithing coal shipped by all methods of transportation except by lake and tidewater.

Table 21.—Shipments of Bituminous Coal by Sizes, from Illinois, 1944[a]
(In tons)

	Amount	Percent
All lump coal and all double screened coal with top size over 2 inches	24,079,291	32.8
All double screened coal with top size not exceeding 2 inches	4,108,790	5.6
Modified mine-run, domestic mine-run, screened mine-run, and altered mine-run and minus resultant with top size over 2 inches	16,427,931	22.3
All minus resultant and dedusted screenings with top size over ¾ inch and not exceeding 2 inches	25,371,284	34.4
All minus resultant and dedusted screenings with top size not exceeding ¾ inch	3,552,531	4.8
Total	73,539,827	100.0
Size not reported	436,929	
Coal used at mines	1,107,120	
Grand Total	75,107,201	

[a] Data from U. S. Bur. Mines Monthly Coal Distribution Reports.

Table 22.—Source of Bituminous Coal Shipped to Illinois, 1944[a] (Exclusive of Railroad Fuel)
(In tons)

District No.	Total
1	11,422
2	9,770
3	57,055
4	9,700
5	—
6	—
7	5,307,105
8	5,236,211
9	698,410
10	26,901,642
11	3,616,355
12	—
13	56
14	266
15	1,018
Total	41,849,010

[a] U. S. Bur. Mines Monthly Coal Reports, Nos. 149-160, July 11, 1944—April 26, 1945.

Degree-Days in 1944

Because of the close relationship between the number of degree-days accumulated during the heating season and the quantity of fuels consumed, a degree-day map of Illinois and a table showing degree-day records for the past heating season compared with the normal is useful in estimating domestic fuel consumption. In this issue a modified degree-day map has been prepared in which county boundaries are used to mark the boundaries of degree-day belts. While this results in some inaccuracies, the purpose is to show the number and types of heating units in each degree-day belt. Since these latter are reported by county units only, it was necessary to prepare a map in which boundaries of degree-day belts conformed to the nearest county boundary.

TABLE 23.—TYPES OF HEATING EQUIPMENT, BY DEGREE-DAY DISTRICTS[a]

Units With Central Heating

District No.	Coal	Wood	Gas	Fuel oil	Total	Other fuel and not reporting
1	60,076	1,250	1,166	5,820	68,312	685
2	807,045	1,099	30,100	46,366	884,610	12,138
3	101,484	841	1,435	3,301	107,061	872
4	140,604	535	5,420	3,109	149,668	2,741
5	55,464	680	804	854	57,802	783
6	36,169	163	127	720	37,179	240
7	9,426	34	13	40	9,513	82
8 St. Louis, Mo.						
St. Louis County	45,379	129	4,868	6,486	56,862	204
St. Louis City	134,419	56	3,650	4,802	142,927	1,399
Total	1,390,066	4,787	47,583	71,498	1,513,934	19,144

Units Without Central Heating

District No.	Coal	Wood	Gas	Fuel oil	Gas or Kero.	Total	Other fuel and not reporting	None
1	19,753	3,002	117	3,958	152	26,982	96	26
2	224,896	3,991	5,529	87,642	581	322,639	1,235	318
3	57,043	4,319	238	3,008	294	64,902	319	69
4	112,727	8,847	864	2,168	357	124,963	495	79
5	90,881	28,595	1,641	1,712	858	123,687	581	105
6	78,043	14,895	704	636	278	94,556	258	48
7	48,115	7,777	26	126	102	56,146	162	87
8 St. Louis, Mo.								
St. Louis Co.	13,422	1,671	130	656	136	16,015	62	25
St. Louis City	83,434	295	752	2,928	156	87,565	272	247
Total	728,314	73,392	10,001	102,834	2,914	917,455	3,480	1,004

[a] Source: U. S. Census, Housing, Illinois, 2nd. Series, 1939.

Degree-days are the number of degrees of temperature that the average temperature for each day falls below 65° Fahrenheit. These are totaled for each month and a cumulative total for the heating season through each month is determined. These data averaged over a long period of time give a reliable guide to the fuel needs of the locality in which the temperatures are recorded. This information is given in table 16, Report of Investigations No. 87.

Figure 6 shows the modified degree-day belts of the state numbered from 1 to 8. District 8 comprises St. Louis City and county and is included in the tabulations because of the interest of the Illinois coal industry in this large market.

In table 23 is shown the number of heating units by each type of fuel used, for each of the degree-day belts outlined on the map.

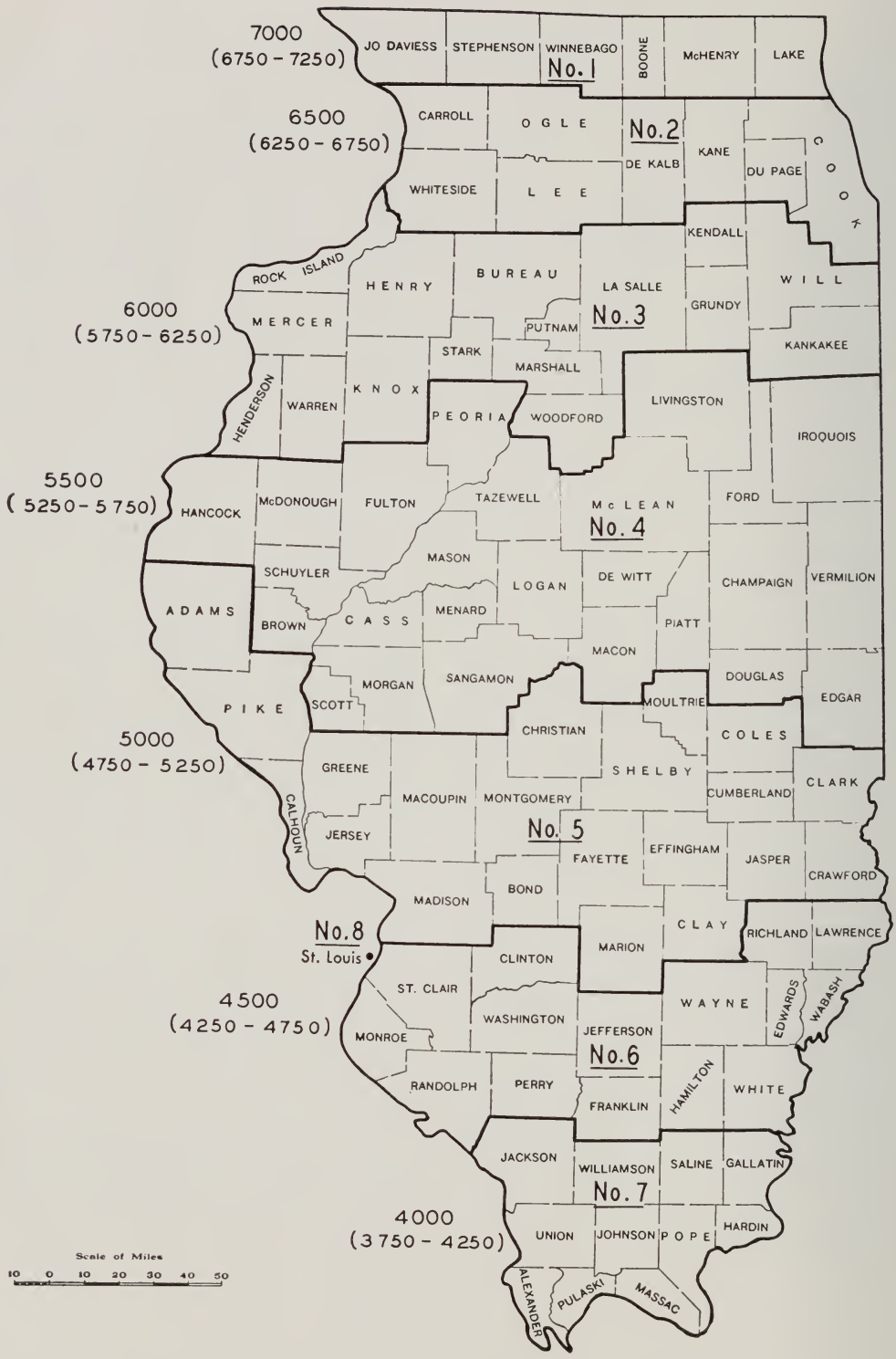

FIG. 6.—Degree-day districts, with averages and ranges. Degree-days are the number of degrees of temperature that the average daily temperature falls below 65° F., and are totalled for the heating season.

TABLE 24.—DEGREE-DAYS FOR 47 ILLINOIS CITIES DURING 1944 AND 1945, BY MONTHS, COMPARED WITH NORMAL AVERAGE OVER THE PERIOD DURING WHICH RECORDS HAVE BEEN KEPT[a], [b]

Month	Aurora (Pop. 47,170)		Bloomington (Pop. 32,868)		Cairo (Pop. 14,407)		Carbondale (Pop. 8,550)	
	M[c]	A[c]	M	A	M	A	M	A
September	0	30	0	0	0	0	0	0
October	403	403	403	310	93	155	186	155
November	690	810	630	720	450	510	510	540
December	1,364	1,178	1,271	1,085	961	806	1,054	686
January	1,457	1,333	1,333	1,209	961	899	1,054	930
February	1,064	1,120	924	1,316	700	756	784	784
March	527	930	279	806	248	527	310	558
April	450	510	330	300	120	210	210	240
May	341	186	248	62	31	0	93	0
Total	6,296	6,500	5,418	5,808	3,564	3,863	4,201	4,075
Departure from normal	—204		—390		—299		+126	

Month	Decatur (Pop. 59,305)		Dixon (Pop. 10,671)		Effingham (Pop. 6,180)		Flora (Pop. 5,474)	
September	0	0	0	30	0	0	0	0
October	248	279	372	403	310	248	217	248
November	600	690	660	810	630	660	570	630
December	1,271	1,054	1,364	1,209	1,240	992	1,116	961
January	1,271	1,178	1,457	1,364	1,240	1,085	1,116	1,054
February	868	1,008	1,036	1,148	896	924	812	896
March	372	744	496	899	403	682	341	650
April	360	360	420	480	360	330	270	300
May	217	62	310	155	248	31	124	31
Total	5,207	5,375	6,115	6,498	5,327	4,952	4,566	4,771
Departure from normal	—168		—383		+375		—205	

Month	Carlinville (Pop. 4,965)		Charleston (Pop. 8,197)		Chicago (Pop. 3, 396,808)		Danville (Pop. 36,919)	
September	0	0	—	0	0	30	0	0
October	217	248	—	279	310	341	372	279
November	600	630	—	660	630	750	630	690
December	1,209	992	1,209	992	1,240	1,116	1,271	1,054
January	1,209	1,116	1,240	1,116	1,333	1,271	1,302	1,147
February	868	924	868	952	1,008	1,064	896	980
March	372	682	403	713	496	899	434	744
April	300	330	330	360	480	540	360	390
May	186	31	217	93	341	248	248	62
Total	4,961	4,953	4,267	5,165	5,838	6,259	5,513	5,346
Departure from normal	+8				—421		+167	

Footnotes are given at end of table.

TABLE 24.—(Continued)

Month	Freeport (Pop. 22,366)		Galva (Pop. 2,812)		Greenville (Pop. 3,391)		Harrisburg (Pop. 11,453)	
	M	A	M	A	M	A	M	A
September	0	60	0	0	0	0	0	0
October	434	434	279	341	217	248	217	155
November	720	840	630	780	540	660	510	510
December	1,457	1,240	1,271	1,178	1,147	992	1,023	837
January	1,519	1,426	1,395	1,302	1,116	1,085	1,023	930
February	1,120	1,176	980	1,120	—	924	756	784
March	558	961	496	837	279	682	341	527
April	450	510	390	450	240	300	210	240
May	341	186	248	124	124	31	93	0
Total	6,599	6,833	5,689	6,132	3,663	4,922	4,173	3,983
Departure from normal	—234		—443				+190	

Month	Havana (Pop. 3,999)		Hoopeston (Pop. 5,381)		Jacksonville (Pop. 19,844)		Joliet (Pop. 42,365)	
September	0	0	0	0	0	0	0	0
October	279	270	341	341	248	279	403	372
November	600	690	630	690	570	660	450	750
December	1,240	1,054	1,302	1,085	1,240	1,054	1,395	1,036
January	1,302	1,178	1,364	1,178	1,271	1,147	1,488	1,271
February	896	1,008	924	1,008	868	980	1,064	1,120
March	403	744	434	775	403	744	558	868
April	300	360	390	420	270	360	480	480
May	217	155	248	93	186	62	372	155
Total	5,237	5,459	5,633	5,590	5,056	5,286	6,210	6,082
Departure from normal	—222		+43		—230		+128	

Month	Kankakee (Pop. 22,241)		La Harpe (Pop. 1,322)		Lincoln (Pop. 12,752)		McLeansboro (Pop. 2,528)	
September	0	30	0	0	0	0	0	0
October	341	341	279	310	310	310	124	186
November	630	720	630	720	600	690	480	570
December	1,302	1,116	1,271	1,116	1,271	1,054	1,023	899
January	1,395	1,240	1,364	1,209	1,302	1,178	1,023	1,023
February	840	1,008	980	1,064	896	1,008	756	840
March	465	806	465	806	403	775	279	620
April	480	480	360	420	330	390	180	270
May	279	155	248	93	217	62	372	0
Total	5,732	5,896	5,597	5,738	5,329	5,467	4,237	4,408
Departure from normal	—164		—141		—138		—171	

TABLE 24.—(Continued)

Month	Marengo (Pop. 2,034)		Mascoutah (Pop. 2,294)		Minonk (Pop. 1,897)		Monmouth (Pop. 9,096)	
	M	A	M	A	M	A	M	A
September	0	90	0	0	0	30	0	30
October	403	465	186	217	341	341	310	341
November	720	870	510	630	660	750	660	750
December	1,395	1,271	1,085	930	1,333	1,147	1,302	1,147
January	1,488	1,426	1,085	1,023	1,395	1,271	1,395	1,302
February	1,092	1,204	784	868	980	1,092	980	1,092
March	558	1,023	341	620	496	837	465	806
April	480	570	240	300	420	450	390	420
May	341	210	93	0	310	93	279	31
Total	6,477	7,129	4,324	4,588	5,935	6,011	5,781	5,919
Departure from normal	—652		—264		—76		—128	

Month	Mt. Carmel (Pop. 6,987)		Mt. Carroll (Pop. 1,845)		Mt. Vernon (Pop. 14,724)		New Burnside	
September	0	0	0	60	0	0	0	0
October	186	186	372	434	155	217	186	155
November	510	600	720	840	540	600	510	540
December	1,054	930	1,395	1,240	1,116	930	1,054	868
January	1,054	992	1,457	1,364	1,147	1,023	1,054	930
February	784	868	1,064	1,176	812	868	756	756
March	279	589	527	930	341	620	279	558
April	180	300	420	510	420	300	420	270
May	62	0	310	186	93	0	93	0
Total	4,109	4,465	6,265	6,740	4,624	4,558	4,352	4,077
Departure from normal	—356		—475		+66		+275	

Month	Palestine (Pop. 1,626)		Pana (Pop. 5,966)		Paris (Pop. 9,281)		Peoria (Pop. 105,087)	
September	0	0	0	0	0	0	0	0
October	248	240	217	279	279	279	341	372
November	570	651	570	660	630	690	660	780
December	1,116	961	1,209	1,023	1,240	1,054	1,333	1,116
January	1,147	1,085	1,209	1,147	1,240	1,147	1,395	1,271
February	840	896	840	952	868	980	980	1,036
March	341	682	372	713	372	775	496	806
April	270	330	300	360	330	390	390	420
May	124	31	155	62	186	62	279	93
Total	4,656	4,876	4,872	5,196	5,145	5,377	5,874	5,894
Departure from normal	—220		—324		—232		—20	

TABLE 24.—(Concluded)

Month	Pontiac (Pop. 9,585)		Quincy (Pop. 40,469)		Rockford (Pop. 84,637)		Rushville (Pop. 2,480)	
	M	A	M	A	M	A	M	A
September	0	30	0	0	0	30	0	0
October	310	310	217	217	372	403	279	279
November	630	690	570	630	660	810	630	720
December	1,271	1,085	1,209	992	1,364	1,209	1,271	1,054
January	1,364	1,209	1,240	1,147	1,457	1,364	1,302	1,178
February	980	1,036	896	924	1,064	1,176	924	1,008
March	434	806	372	713	527	930	465	744
April	390	420	270	330	450	510	330	360
May	248	93	155	0	341	186	217	62
Total	5,627	5,679	4,929	4,953	6,235	6,618	5,418	5,405
Departure from normal	—52		—24		—383		+13	

Month	Sparta (Pop. 3,664)		Springfield (Pop. 75,503)		Sycamore (Pop. 4,702)		Urbana (Pop. 14,064)	
	M	A	M	A	M	A	M	A
September	0	0	0	0	0	60	0	0
October	124	186	217	279	434	434	310	310
November	510	570	600	690	720	840	630	720
December	1,054	899	1,209	1,023	1,395	1,209	1,271	1,085
January	1,054	992	1,271	1,147	1,488	1,364	1,302	1,178
February	756	840	896	980	1,092	1,176	896	1,008
March	310	589	403	744	558	961	434	775
April	210	270	300	360	480	540	390	450
May	93	0	186	62	372	217	248	124
Total	4,111	4,346	5,082	5,285	6,539	6,801	5,481	5,680
Departure from normal	—235		—203		—262		—199	

Month	Walnut (Pop. 961)		Waukegan (Pop. 34,241)		Whitehall (Pop. 3,025)	
	M	A	M	A	M	A
September	0	30	0	30	0	0
October	372	341	372	403	217	279
November	660	780	660	780	540	660
December	1,333	1,178	1,333	1,147	1,178	1,023
January	1,426	1,302	1,426	1,302	1,209	1,147
February	1,008	1,120	1,064	1,092	840	924
March	465	868	527	961	372	713
April	420	450	480	600	270	330
May	279	90	372	279	155	31
Total	5,963	6,159	6,234	6,594	4,781	5,107
Departure from normal	—196		—360		—326	

[a] Compiled from U. S. Dept. Commerce, Weather Bureau, Climatological Data.
[b] Population from Sixteenth Census of the United States.
[c] Column M—Monthly total for 1944-45 heating season. Column A—Normal monthly average for entire period during which records have been kept. (See Illinois Geol. Survey Rept. Inv. No. 87, table 16.)

TABLE 25.—PRODUCTION OF FUEL BRIQUETS IN THE UNITED STATES, 1943 AND 1944

States	1943			1944			Percent of increase over 1943 in	
	No. of plants	Net tons	Value	No. of plants	Net tons	Value	Tonnage	Value
Eastern	4	544,786	$ 2,746,109	5	625,779	$ 3,393,595	14.9	23.6
Central	21	1,493,368	11,110,885	22	1,704,005	13,680,036	14.1	23.1
Pacific Coast	3	125,844	1,291,115	3	135,177	1,360,948	7.4	5.4
Total	28	2,163,998	$15,148,109	30	2,464,961	$18,434,579	13.9	21.7

FUEL BRIQUETS AND PACKAGED FUEL

The principal locations for production of briquets are: (1) in the dock cities of the lake states, where enormous quantities of fines accumulate as a consequence of the rough handling of the coal in transit; and (2) in the coal producing districts of West Virginia, Pennsylvania, and southern Illinois, where the nature of the coal results in a high percentage of fines being produced in the process of mining. Minor quantities are produced in other eastern and central states and on the Pacific coast.

Production of briquets.—The fuel briquetting industry exceeded the previous year's record for the sixth consecutive time in 1944, reaching a new high of 2,464,961 net tons valued at $18,434,579. This was an increase over 1943 of 13.9 percent in tonnage and 21.7 percent in valuation. Of this amount 69 percent was produced in the central states, as shown in table 25.

This shows an increased lead for the central states over the remainder of the country from 42.5 percent in 1943 to 69 percent in 1944.

The briquetting industry was utilizing 28 percent of its total capacity at the beginning of the war in 1939. By 1944 it had geared production to 70.6 percent of its total capacity.

The states in the Upper Mississippi Valley again increased their lead over the remainder of the country as consumers of fuel briquets. Major consumers in this area are Wisconsin, Minnesota, Missouri, North Dakota, South Dakota, and Illinois.

Briquets marketed in Wisconsin and Minnesota are manufactured mainly from low-volatile coal screenings obtainable on the lake docks and produced as a result of the double handling of coal from rail to lake and back to rail again at upper lake docks. In North Dakota and South Dakota, the market is supplied by briquets manufactured from the lignites of North Dakota.

Table 26 gives the shipments of fuel briquets of domestic manufacture into the Illinois coal market area in 1942, 1943, and 1944.

TABLE 26.—SHIPMENTS OF FUEL BRIQUETS OF DOMESTIC MANUFACTURE INTO THE ILLINOIS COAL MARKET AREA, 1942–1944
(In tons)

Destination	1942[a]	1943[b]	1944[b]
Illinois	65,709	85,174	90,358
Indiana	48,868	48,071	49,235
Iowa	47,392	61,150	90,379
Kansas	10,731	12,018	16,595
Kentucky	4,954	3,757	3,477
Minnesota	303,497	487,122	515,671
Missouri	172,269	202,562	254,360
Nebraska	35,111	38,693	44,900
North Dakota	96,912	94,172	125,331
South Dakota	73,744	84,585	118,811
Wisconsin	317,627	425,258	448,313
Total	1,176,814	1,542,562	1,757,430
Total—United States	1,600,300	1,970,143	2,278,480
Percent of U. S. total	73.6	78.2	77.2

[a] U. S. Bur. Mines Mineral Market Report No. 1175, May 26, 1944.
[b] U. S. Bur. Mines Mineral Market Report No. 1312, July 3, 1945.

TABLE 28.—COKE AND BYPRODUCTS, PRODUCED, SOLD

	1941*		
	Quantity	Value at plants	
		Thousands of dollars	Av.
Coal used (M tons)	5,142	$25,319	$4.92
Coal per ton of coke (tons)	1.40		6.89
Coke produced (M tons)	3,661	25,215	6.89
Yield of coke (percent of coal used)	71.20		
Plants in operation	9		
Byproduct ovens operating in Illinois:			
Koppers	661		
Koppers–Becker			
Semet-Solvay	120		
Wilputte	88		
Curran-Knowles	46		
Coal-gas retorts	—		
Total operating	915		
Ovens under construction, Dec. 31	—		
Sources of coal used (M tons)			
Illinois	236		
Indiana	46		
Kentucky	1,419		
Pennsylvania	378		
Tennessee	14		
Virginia	11		
West Virginia	3,059		
Total (M tons)	5,163		
Low volatile	1,895		
Medium volatile	967		
High volatile	2,301		
Coke, sold or used by producer (M tons)			
Used by producer in blast furnace[c]	2,585	16,723	6.48
Sold for furnace use	8	40	5.00
Sold for foundry use	354	3,811	10.73
Sold for domestic use	734	4,909	6.71
Sold for industrial and other use	94	677	7.29
Total sold or used	3,775	26,160	6.92
Coke breeze produced (M tons)	326	—	—
Coke breeze sold or used	304	736	2.42
Coke-oven byproducts			
Ammonia produced (sulfate equiv.) (M lbs.)	95,149	—	—
Per ton of coal coked (lbs.)	19.40		
Sulfate equivalent sold (M lbs.)	97,838	1,093	.011
Coke-oven gas produced (Millions cu. ft.)	51,267	—	—
Used in heating ovens, boilers, etc.	24,601	2,234	.091
Surplus sold	25,535	4,289	.168
Light oil and derivatives sold (M gals.)	[b]	—	—
Napthalene sold (M lbs.)	[b]	—	—
Tar produced (M gals.)	38,218	—	—
Per ton of coal coked (gals.)	7.43		
Tar and derivatives sold (M gals.)	31,575	1,449	.046
Other byproducts sold (M gals.)	[b]	—	—
Total byproducts sold or used	—	9,065	—
Total coke and byproducts sold or used	—	$35,961	—

* Revised figures.
[a] U. S. Bur. Mines Minerals Yearbooks and Monthly Coal Report No. 207, June 29, 1945.
[b] Not available.

OR USED BY PRODUCERS IN ILLINOIS, 1941-1944[a]

1942*			1943*			1944			
Quantity	Value at plants		Quantity	Value at plants		Quantity	Value at plants		Percent change in amount from 1943
	Thousands of dollars	Av.		Thousands of dollars	Av.		Thousands of dollars	Av.	
5,225	$27,594	$5.28	5,170	$29,059	$5.62	5,482	$33,110	$6.04	+ 6.0
1.42		7.50	1.43		8.04	1.41		8.52	
3,690	27,364	7.42	3,627	29,379	8.10	3,879	34,074	8.78	+ 6.9
70.63			70.15			70.75			
9			11			9			
379			380			[b]			
282			329						
120			120						
88			88						
46			46						
—			12						
915			975			992			
124			75			—			
227			218						
81			69						
1,523			1,505						
311			457						
—			—						
13			—						
3,200			2,765						
5,355			5,014			[b]			
1,905			1,419						
976			852						
2,474			2,743						
2,562	18,321	7.43	1,827	14,210	7.78	1,871	15,686	8.38	+ 2.4
152	1,210	8.03	1,054	8,785	8.33	1,107	9,400	8.49	+ 5.0
298	3,221	10.80	318	3,454	10.84	285	3,461	12.14	−10.4
585	3,964	6.78	344	2,288	6.65	506	4,662	9.21	+47.1
109	803	7.36	117	925	7.92	106	852	8.05	− 9.4
3,706	27,519	7.42	3,660	29,662	8.10	3,875	34,061	8.79	+ 5.9
321	—	—	344	—	—	374	—	—	+ 8.7
330	791	2.40	338	939	2.78	311	933	3.00	− 8.0
95,466	—	—	97,070	—	—	102,909	—	—	+ 6.0
19.10			19.61			18.77			
95,696	1,096	.011	97,436	1,155	.012	84,050	1,056	.013	−13.7
50,672	—	—	49,870	—	—	54,864	—	—	+10.0
23,994	2,353	.099	24,618	3,374	.136	17,351	1,735	.10	−29.5
25,894	3,395	.131	23,603	3,726	.158	36,466	5,442	.149	+54.5
9,049	1,417	.156	9,620	1,298	.135	[b]	[b]	—	
1,480	26	.018	1,736	53	.031	[b]	[b]	—	
38,820	—	—	39,462	—	—	38,099	—	—	− 3.5
7.43			7.63			6.95			
29,713	1,601	.054	55,668	2,767	.05	37,810	2,023	.054	−32.1
[b]	—	—	55	42	.776	[b]	[b]	—	
—	9,888	—	—	12,415	—	—	10,256	—	−17.4[d]
—	$38,198	—	—	$43,016	—	—	$45,250	—	+ 5.2[d]

[c] Includes gas used in making producer gas and water gas.
[d] Percent change in value from 1943.

Table 27.—Production and Value of Packaged Fuel in Illinois, 1940–1944[a]

Year	Amount tons	Value at plants		Number of plants
		Total	Average	
1940...	3,813	$36,531	$ 9.60	6
1941...	8,924	95,431	10.60	6
1942...	4,980	60,001	12.05	6
1943[b]..	3,081	38,445	12.48	4
1944[c]..	1,837	23,037	12.55	4

[a] U. S. Bur. Mines Minerals Yearbooks.
[b] U. S. Bur. Mines Mineral Market Report No. 1175.
[c] U. S. Bur. Mines Mineral Market Report No. 1312.

The production of fuel briquets in Illinois is increasing, an important part of this production being made from the deduster dust, a byproduct obtained in the preparation of stoker fuel from southern Illinois coal. It is impossible to publish data on the production of fuel briquets in Illinois without revealing operations of individual concerns.

Coke and Byproducts

The year 1944 witnessed a new high in coke production in Illinois in response to the heavy demand of the iron and steel industry for metallurgical fuel. A statistical summary of the coke industry in Illinois is given in table 28.

PETROLEUM AND GAS

Petroleum in 1944—the National Picture

Petroleum production in the United States in 1944 again exceeded all previous records. Under stress of war demands, the industry produced 1,677,753,000 barrels, exceeding 1943 production by 172,140,000 barrels. Just before Pearl Harbor, the nation was using an average of 3.7 million barrels of crude petroleum daily. In 1944 this average stepped up 4.6 million barrels. Yet so great have been the demands of war that, in spite of this increase, it was necessary to impose sharp restrictions on the quantity of petroleum allotted to civilians.

Petroleum in World Wars I and II

It may be interesting to compare the petroleum industry in the United States in World Wars I and II, selecting the years 1917 and 1944 for comparison (table 29).

Table 29.—Oil Production in Two Wars
(In barrels)

	1917	1944
United States	335,315,000	1,677,753,000
Five leading states in 1917:		
Oklahoma	107,507,000	124,616,000
California	93,878,000	311,793,000
Kansas	36,536,000	98,762,000
Texas	32,413,000	748,122,000
Illinois	15,777,000	77,413,000

Estimated Reserves

The national picture of petroleum reserves at the end of 1944 remained unchanged in the states that contribute to the Illinois refining industry. There were additions in Oklahoma, Illinois, Kentucky, and Michigan but there were losses in Kansas and Arkansas. The estimated reserve as of January 1, 1945 and preceding years is shown in table 30.

These estimates, which are prepared each year by the American Petroleum Institute, are conservative. They include only oil reserves in proved fields on production and quantities recoverable with existing methods of production at existing prices. It by no means is an evaluation of undiscovered or untested reserves or of the oil ultimately recoverable in this area. The figure for each year represents the estimated reserves as of the given date after deducting the quantity withdrawn during the year and adding the current discoveries, extensions, and upward revisions for existing pools.

Production

The production of oil in the United States, by states grouped according to pro-

Table 30.—Estimates of Proved Oil Reserves in the States Serving the Illinois Area, Jan. 1, 1935–Jan. 1, 1945[a]
(Millions of barrels)

As of Jan. 1	Oklahoma	Kansas	Illinois	Arkansas	Kentucky	Indiana	Nebraska	Michigan
1945	970	602	321	293	41	31	1	65
1944	909	646	295	297	35	31	1	55
1943	969	687	307	300	35	32	2	64
1942	1,036	690	334	295	36	23	—	56
1941	1,002	692	315	306	41	14	—	35
1940	1,063	726	382	320	44	14	—	51
1939	1,162	613	243	188	38	6	—	43
1938	1,212	601	41	192	38	3	—	49
1937	1,141	568	28	84	39	3	—	44
1936	—	—	—	—	—	—	—	—
1935	1,235	390	37	103	50	5	—	64

[a] From reports of Committee on Petroleum Reserves, American Petroleum Institute.

TABLE 31.—CRUDE OIL PRODUCTION IN THE UNITED STATES, BY DISTRICTS AND STATES, 1939–1944[a]
(In thousands of barrels)

Districts and States	1939		1940		1941		1942		1943		1944	
	Quantity	Per cent[b]	Quantity	Per cent[b]	Quantity	Per cent[b]	Quantity	Per cent[b]	Quantity	Per cent[b]	Quantity	Per cent[b]
Midcontinent:												
Arkansas	21,238		25,775		26,327		26,628		27,600		29,418	
North Louisiana	25,403		24,406		24,991		29,310		27,398		24,012	
Kansas	60,703		66,139		83,242		97,636		106,178		98,762	
New Mexico	37,637		39,129		39,569		31,544		38,411		39,555	
Oklahoma	159,913		156,164		154,702		140,690		123,152		124,616	
Texas (except Gulf)	361,005		371,043		370,840		348,077		393,392		486,998	
Total	665,899	52.6	682,656	50.5	699,671	49.9	673,885	48.6	716,131	47.6	803,361	47.8
California:												
California	224,354	17.7	223,881	16.5	230,263	16.4	248,326	17.9	284,235	18.9	311,793	18.6
Gulf Coast:												
Louisiana Gulf	68,243		79,178		90,917		86,475		96,194		105,195	
Texas Gulf	122,523		122,166		134,732		135,020		200,128		261,124	
Mississippi	107		4,400		15,327		28,833		18,807		16,337	
Total	190,873	15.1	205,744	15.2	240,976	17.2	250,328	18.0	315,129	20.9	382,656	22.8
Rocky Mountain:												
Colorado	1,404		1,626		2,150		2,199		2,320		2,944	
Montana	5,960		6,728		7,526		8,074		7,916		8,627	
Wyoming	21,454		25,711		29,878		32,812		33,077		32,388	
Total	28,818	2.3	34,065	2.5	39,554	2.8	43,085	3.1	43,313	2.9	43,959	2.6
Central:												
Illinois	94,912		147,647		132,393		106,391		82,260		77,413	
Indiana	1,711		4,978		7,411		6,743		5,283		5,118	
Kentucky	5,621		5,188		4,762		4,534		7,883		9,621	
Ohio	3,156		3,159		3,510		3,543		3,322		2,937	
Michigan	23,462		19,753		16,359		21,754		20,768		18,490	
Total	128,862	10.2	180,725	13.3	164,435	11.8	142,965	10.4	119,516	10.4	113,579	6.6

Eastern:												
Pennsylvania	17,382		17,353		16,750		17,779		15,757		14,118	
New York	5,098		4,999		5,185		5,421		5,059		4,697	
West Virginia	3,580		3,444		3,433		3,574		3,349		3,070	
Total	26,060	2.1	25,796	2.0	25,368	1.8	26,774	1.9	24,165	1.7	21,885	1.3
Other: [c]	96	—	347	—	1,961	0.1	1,282	0.1	687	.4	520	.3
Total United States	1,264,962	100.0	1,353,214	100.0	1,402,228	100.0	1,386,645	100.0	1,503,176	100.0	1,677,753	100.0
Illinois	94,912	7.5	147,647	10.9	132,393	9.4	106,391	7.7	82,260	5.5	77,413	4.6

[a] U. S. Bur. Mines, Minerals Yearbooks and Annual Petroleum Statement No. P241, Monthly Petroleum Statement No. P245.
[b] Percent of total U. S. production.
[c] The states reporting are not identical from year to year.
[d] Included in "Other."

ducing districts, is given in table 31 for the years 1939-1944. The total value of crude oil and related products produced or used in Illinois is given in table 32. The Illinois value in 1944 shows a moderate decline from that of 1943.

Prices of Crude Oil in 1944

Prices of crude petroleum products were subject to ceilings established by the Office of Price Administration. Subsidies were paid to producers for wells in the stripper class as defined by the O.P.A. regulations. No over-all data are available on the total sum paid to operators in Illinois, but such payments are in addition to the average value as shown in tables 33 and 34.

Table 33.—Average Value of Crude Oil in Illinois, 1937–1944[a]
(Per barrel at wells)

1937	$1.33
1938	1.25
1939	1.07
1940	1.06
1941	1.30
1942	1.36
1943	*1.37
1944	1.37

* Revised figure.
[a] U. S. Bur. Mines, Minerals Yearbooks, and Monthly Petroleum Statement No. P. 258—Mar. 5, 1945.

Gasoline

Table 35 shows a decline in stocks of crude oil in the United States but an increase over the year for both crude stocks and refined products in Illinois. In table 36 the effects of gasoline rationing are shown in the virtually constant level of consumption for the years 1943 and 1944.

TABLE 32.—CRUDE OIL AND RELATED PRODUCTS, PRODUCED, SOLD, OR USED BY PRODUCER IN ILLINOIS, 1942–1944[a]

	1942			1943*			1944			
	Production	Value at wells		Production	Value at wells		Production	Value at wells		Percent change in amount from 1943
		Total	Av.		Total	Av.		Total	Av.	
Crude oil (bbls.)	106,391,000	$144,800,000	$1.36	82,260,000	$112,700,000	$1.37	77,413,000	$106,055,800	$1.37	— 5.9
Natural gas (M cu. ft.)										
Marketed as gas	14,484,000	* 532,000	.037	18,120,000	884,000	.049	[b] 17,000,000	[b] 850,000	.05	— 6.2
Used in fields[c]	11,645,000	* 416,000	.035	14,424,000	661,000	* .046	[b] 13,600,000	[b] 680,000	.05	— 5.4
Total	26,129,000	948,000	.036	32,544,000	1,545,000	* .047	[b] 30,600,000	[b] 1,530,000	.05	— 6.0
Returned to underground formations	2,258,000	—	—	995,847	—	—	[b] 940,000	—	—	— 3.6
Natural gasoline (gals.)	66,389,000	3,252,000	.049	71,737,000	4,072,000	.057	64,500,000	3,483,000	.054	—10.1
Liquefied petroleum gases, (Butane, propane) (gals.)	72,934,000	2,000,000	.027	113,750,000	3,358,000	.029	136,000,000	3,400,000	.025	+19.6
Total value		$151,000,000			$121,675,000			$114,468,800		[d] — 5.9

* Revised figures.
[a] U. S. Bur. of Mines Minerals Yearbooks, and P. 258—Mar. 5, 1945.
[b] Estimated for 1944.
[c] Includes extraction loss and fuel used in natural gasoline plants.
[d] Percent change in value from 1943.

TABLE 34.—CRUDE OIL PRICE CHANGES FOR ILLINOIS, INDIANA, KENTUCKY AND OHIO, 1944. [a]

	January 5, 1944	December 27, 1944
Posted by Sohio Corp. (May 21, 1941)		
Illinois basin [b], including Griffin pool	$1.37	$1.37
Carmi, Storms (Illinois) area	1.32	1.37 (Jan. 24, 1944)
Birk City (Kentucky) area	1.37	1.37
Corydon (Kentucky) area, Henderson	1.37	1.37
Posted by Ohio Oil Co. (May 21, 1941)		
Illinois basin	1.37	1.37
Eastern Illinois and Western Indiana	1.22	1.22
Posted by Carter Oil Co. (May 21, 1941)		
Louden, Fayette County, Illinois	1.37	1.37
Posted by Mohawk Oil Lines, Inc. (May 21, 1941)		
Southern Illinois	1.37	1.37
Posted by Ashland Oil & Transp. Co. (June 19, 1941): Somerset Oil in Ashland Lines, Ky.		
Big Sandy River	1.38	1.38
Kentucky River	1.43	1.43
Posted by Owensboro-Ashland Co. (May 21, 1941)		
Owensboro (Kentucky) area	1.37	1.37
Posted by Sohio Corp. (Sept. 1, 1941)		
Lima, Ohio	1.50	1.50
Cleveland, Lodi & Chatham (Ohio) areas	1.30	1.30

[a] Nat'l Petroleum News, Dec. 29, 1943, January 5, 1944, January 24, 1944, and December 27, 1944.
[b] Also posted by the Texas Company.

TABLE 35.—STOCKS OF CRUDE OIL AND REFINED PRODUCTS IN THE UNITED STATES, IN ILLINOIS, AND IN THE CENTRAL REFINING DISTRICT, BY MONTHS, 1944[a]
(In thousands of barrels)

1943	Total crude stocks		Stocks of refined products			
			Central Refining District			United States
	United States	Illinois	Gasoline	Distillate fuel oil[b]	Residual fuel oil[b]	Gasoline
January	241,245	14,375	17,490	5,353	3,278	81,509
February	241,718	14,454	19,184	5,486	2,892	84,752
March	236,530	14,487	20,739	4,703	2,774	87,100
April	234,694	13,371	20,297	4,791	2,603	88,373
May	235,176	13,004	20,037	4,924	2,918	86,712
June	229,631	12,966	18,477	5,229	3,488	81,984
July	223,503	13,356	18,400	5,389	4,157	80,502
August	223,901	13,425	17,302	5,769	4,314	78,466
September	222,868	13,819	16,093	7,938	4,141	76,986
October	223,500	13,783	16,080	6,940	3,944	78,274
November	222,759	13,709	16,566	6,979	3,570	80,574
December	220,862	16,095	19,765	6,419	3,060	86,830

[a] U. S. Bur. Mines Monthly Petroleum Statements.
[b] Includes refinery and bulk stocks.

TABLE 36.—GASOLINE SOLD IN ILLINOIS, 1941–1944, BY MONTHS
(Thousands of gallons)

	1941[a]	1942[a]	1943*[b]	1944[b]
January	111,386	116,305	75,700	84,769
February	105,883	96,237	74,851	80,818
March	127,451	114,387	92,646	93,186
April	140,940	131,138	101,313	87,619
May	162,605	138,072	98,034	121,048
June	148,451	132,000	119,149	119,005
July	155,021	131,683	110,791	97,928
August	155,969	127,469	101,957	97,616
September	145,618	125,830	95,369	99,257
October	143,406	125,274	100,486	102,465
November	134,510	139,732	100,494	94,873
December	135,538	63,479	93,793	87,741
Total	1,666,778	1,441,606	1,164,583	1,166,325

* Revised figures.
[a] Illinois Gasoline Tax Data: Illinois Gasoline Tax Evasion Committee, Monthly reports.
[b] American Petroluem Institute.

GASEOUS FUELS IN ILLINOIS IN 1944

Gas, both natural and manufactured, constitutes an important fuel in certain Illinois industries and localities, particularly Chicago and its environs, as shown in table 37.

Natural gas is obtained from fields both within the State and by importation from three fields in the Midcontinent—the Hugoton field in Kansas, the Amarillo field in the Panhandle of Texas, and the Monroe field in northern Louisiana. The Hugoton gas field supplies cities in central Illinois. The City of Chicago and its environs is supplied by pipelines from the Amarillo field, and the St. Louis industrial district is supplied from Monroe, Louisiana. The above named fields supplying Illinois are primarily gas fields.

About 5 percent of the natural gas used in Illinois is obtained within the State. Most of this production is associated with the output of petroleum, although there are two small gas fields in Illinois which have also contributed to the supply.

Manufactured gas is obtained principally as a byproduct of the coking and blast furnace industry and petroleum refining, although a considerable portion is manufactured in gas producers for sale to the public.

The gas manufactured as a byproduct of the coking industry, blast furnace operations, and the refining of petroleum, is used primarily in plant operations, and only a small surplus is sold to the public through the utilities. For example, the low calorific gas resulting from blast furnace operations may be used as a fuel for operating the compressor engines or heating the stoves of a blast furnace plant. Surplus gas from a byproduct coking process may be used in the open-hearth furnace, in the soaking pits, or in several re-heat operations.

The principal outlet of manufactured gas is in manufacturing industries; the public utilities use natural gas or mixed gas in which natural gas is the more important ingredient.

The economics of gas distribution through public utilities in Illinois is of interest because the conditions of distribution and the rates are affected by the cost of transmission from distant fields and the seasonality of the domestic heating load.

Because of the long transmission distance, approximately 900 miles, and the high overhead cost involved, it is advantageous to maintain a full load in the line if a market can be found for surplus gas in off-peak periods. The seasonality of demand in the house-heating load is shown in table 39. This, together with gas for cooking and water heating, returns the highest gross revenue to the utilities. The load in the sum-

TABLE 37.—CONSUMPTION OF NATURAL GAS AND MANUFACTURED GAS IN ILLINOIS, 1943 AND 1944[a]

	1943	1944
Total sales to ultimate consumers		
Number of customers	1,455,830	1,471,759
Therms used[b]	958,349,542	981,668,315
Revenue	$66,176,615	$67,665,782
Revenue per therm, cents	6.95	6.89
Residential sales, excl. of space heating		
Number of customers	1,319,122	1,335,074
Therms used	190,727,531	197,740,370
Revenue	$32,578,387	$33,447,945
Revenue per therm, cents	17.08	16.92
Residential space heating sales		
Number of customers	59,829	59,561
Therms used	130,870,210	122,862,765
Revenue	$10,534,688	$9,949,049
Revenue per therm, cents	8.05	8.10
Total commercial sales		
Number of customers	68,760	68,695
Therms used	86,423,136	88,322,730
Revenue	$7,573,681	$7,610,588
Revenue per therm, cents	8.79	8.62
Industrial non-interruptible		
Number of customers	7,838	8,189
Therms used	139,818,748	163,969,928
Revenue	$7,645,316	$8,772,445
Revenue per therm, cents	5.47	5.35
Industrial interruptible		
Number of customers	162	168
Therms used	409,670,604	408,035,182
Revenue	$7,775,390	$7,828,378
Revenue per therm, cents	1.90	1.92
Public street and highway lighting		
Number of customers	3	3
Therms used	461,591	476,600
Revenue	$30,951	$31,942
Revenue per therm, cents	6.75	6.70
Other sales to public authorities		
Number of customers	116	69
Therms used	377,722	260,740
Revenue	$38,202	$25,405
Revenue per therm, cents	10.11	9.77

[a] Source: Illinois Commerce Commisson, Rates and Research Section, Research Bulletin 41.
[b] A therm is 100,000 B.t.u.'s.

mer season, however, is very low, as for example in August 1944, the load for this month was 17 percent of the yearly average and 4 percent of the January load, the month of highest consumption. The transmission system, however, is maintained at full capacity by offering gas for industrial use at especially low rates but subject to a "cut-off" clause which permits the utility to shut off the supply to the industrial consumer on short notice in order to take care of sudden increases in the load among domestic users. Under these conditions, the utility can profitably dispose of surplus gas during off-peak periods at a price merely above the cost of the gas without charges to overhead, since the latter are unchanged by the full capacity operation of the pipe-line

TABLE 38.—GAS SALES TO ULTIMATE CONSUMERS IN ILLINOIS, 1944, BY USES AND BY MONTHS[a]
(In thousands of therms)

Month	Residential sales exclusive of space heating	Residential space heating	Industrial interruptible sales	Commercial-industrial non-interruptible and other sales	Industrial non-interruptible sales	Total
January	16,640	20,727	32,205	8,278	11,273	89,123
February	16,235	17,711	29,892	7,802	11,517	83,157
March	16,558	18,374	31,230	7,804	12,583	86,549
April	16,390	15,461	32,451	8,416	14,127	86,845
May	16,456	9,242	37,313	8,265	14,849	86,125
June	16,678	3,863	38,962	6,728	14,151	80,382
July	15,867	2,116	40,985	6,396	13,688	79,052
August	14,925	1,753	38,392	5,967	14,660	75,697
September	16,253	2,219	35,803	6,256	14,708	75,239
October	17,230	4,791	33,206	7,220	15,510	77,957
November	17,104	9,179	31,638	8,303	14,249	80,473
December	17,269	17,428	25,920	7,748	12,700	81,065
Total	197,605	122,864	407,997	89,183	164,015	981,664

[a] Figures from "Monthly Summary of Gas Sales in Illinois," Illinois Gas Utilities, Rates and Research Section.

TABLE 39.—VALUE OF GAS SALES TO ULTIMATE CONSUMERS IN ILLINOIS, 1944, BY USES AND BY MONTHS[a]
(In thousands of dollars)

Month	Residential sales exclusive of space heating	Residential space heating	Industrial interruptible sales	Commercial and other sales	Industrial non-interruptible sales	Total
January	$ 2,779	$ 1,542	$ 628	$ 776	$ 680	$ 6,405
February	2,731	1,342	595	743	694	6,105
March	2,758	1,388	619	747	734	6,246
April	2,749	1,192	633	725	742	6,041
May	2,777	770	699	651	749	5,646
June	2,828	393	726	551	712	5,210
July	2,719	257	747	507	693	4,923
August	2,616	228	713	481	731	4,769
September	2,799	269	677	510	740	4,995
October	2,921	465	646	573	779	5,384
November	2,883	771	621	663	768	5,706
December	2,878	1,332	523	750	755	6,238
Total	$33,438	$9,949	$7,827	$7,677	$8,777	$67,668

[a] Figures from "Monthly Summary of Gas Sales in Illinois," Illinois Gas Utilities, Rates and Research Section.

and have already been calculated in the rates charged for firm loads. The importance of the industrial interruptible sales from the point of view of quantity of gas delivered is shown in table 38.

The revenues for the several types of services are shown in table 39. The growth of the several classes of consumer demand over a period of several years is shown in table 40.

Table 40.—Gas Sales to Ultimate Consumers in Illinois, by Principal Uses, 1940–1944[a]
(In thousands of therms)

Uses	1940	1941	1942	1943*	1944
Residential sales exclusive of space heating	176,266	176,357	182,250	190,728	197,740
Residential space heating sales	107,312	105,520	124,068	130,870	122,863
Commercial sales	73,413	76,679	85,137	86,423	88,323
Industrial non-interruptible	74,181	95,180	109,234	139,819	163,970
Industrial interruptible	377,970	378,658	449,508	409,671	408,035
Public agencies	847	954	1,137	839	737
Total	809,989	833,348	951,334	958,350	981,668

* Revised figures.
[a] Illinois Commerce Commission, Rates and Research Section, Research Bulletins Nos. 35, 40, 41.

STONE, ROCK PRODUCTS

Limestone, Dolomite, and Marl

Production of limestone, dolomite, and marl in Illinois in 1944 amounted to 10,655,800 tons, valued at the plants at $10,677,100. This was a decrease of about 7 percent in amount from that of the previous year. Details of production are given in table 41 and 42, by kind and by use.

Commercial and government-and-contractor operations.—Production of commercial operations is separated from that of government-and-contractor operations, which include the following: State of Illinois, counties, townships, and municipalities, produced either by themselvs or by contractors expressly for their use. Purchases by government agencies from commercial producers are included in commercial operations. Government-and-contractor operations declined 16 percent, compared with 7 percent decline for commercial operations. Government-and-contractor operations produced only 2 percent of the total tonnage of stone.

Agstone Used in Illinois in 1944.—Reports of producers to the Illinois State Geological Survey show that the amount of agstone (ground limestone, dolomite, and marl) used for soil improvement in Illinois during 1944 amounted to more than 4,210,000 tons (table 43). This was more than 30 percent increase over that used in 1943 and establishes a new all-time high record.

This remarkable increase in production of agstone resulted because a few larger producers concentrated on agstone and really made it "big business." Out of 25 plants, each of which reported more than 50,000 tons sold during the year, 19 plants sold considerably more than during the previous year. Out of 90 plants, each of which reported less than 50,000 tons sold, 70 plants made small increases. Many producers, large and small, suffered from scarcity of labor and difficulty in securing truck transportation and repairs, due to wartime conditions.

TABLE 41.—LIMESTONE, DOLOMITE, AND MARL, BY USES, SOLD OR USED BY PRODUCERS, 1943 AND 1944[a]

Use	Type of operation	1943*				1944				
		Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants		Percent change in amount from 1943
				Total	Av.			Total	Av.	
Industrial										
Agstone[c]	Commercial...	91	3,106,159	$ 3,052,990	$0.98	117	4,037,062	$ 4,236,418	$1.05	+30.0
Agstone	Gov.-contr....	5	39,771	32,695	.82	4	35,987	30,289	.84	− 9.6
Metallurgical and flux[d]	Commercial...	10	868,798	854,034	.98	6	940,062	940,414	1.00	+ 8.2
Whiting substitutes[e]	" ...	2	6,407	43,611	6.81	3	10,924	39,537	3.62	+70.5
Miscellaneous fillers[f]	" ...	6	97,433	303,814	3.12	5	145,997	425,924	2.92	+49.8
Other industrial uses[g]	" ...	6	145,511	331,457	2.28	5	99,302	185,684	1.87	−31.8
Total industrial	Both	96	4,264,079	4,618,601	1.08	121	5,269,334	5,858,266	1.11	+23.6
Construction										
Concrete and paving	Commercial...	48	6,011,977	5,006,605	.83	62	4,001,779	3,675,515	.92	−33.4
Concrete and paving	Gov.-contr....	21	189,547	173,538	.92	12	153,539	136,745	.90	−19.0
Railroad ballast	Commercial...	16	723,281	547,928	.76	15	1,016,511	775,677	.76	+40.5
Rubble and veneering stone	" ...	5	1,783	2,386	1.34	5	4,437	4,910	1.11	+148.8
Rubble and veneering stone	Gov.-contr....	1	1,569	1,020	.65	1	50	25	.50	−97.5
Flagging	Commercial...	3	479	2,380	4.97	5	6,595	8,431	1.28	+1276.8
Riprap	" ...	17	96,665	112,357	1.16	20	56,758	69,938	1.23	−41.3
Riprap	Gov.-contr....	2	3,977	9,418	2.37	4	8,285	13,964	1.69	+108.3
Other construction uses[h]	Commercial...	5	126,778	172,425	1.36	8	138,526	133,630	.96	+ 9.3
Total construction	Both	75	7,156,056	6,028,057	.84	83	5,386,480	4,818,835	.90	−24.7
Total commercial operations	Commercial...	94	11,185,271	10,429,987	.93	123	10,457,953	10,496,078	1.00	− 6.6
Total gov.-contr. operations	Gov.-contr....	23	234,864	216,671	.92	15	197,861	181,023	.91	−15.8
Total stone	Both	117	11,420,135	$10,646,658	$0.93	138	10,655,814	$10,677,101	$1.00	− 6.7

* Revised figures.
[a] Compiled from joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Number of plants reporting production.
[c] Includes a small amount of marl.
[d] Includes stone for aluminum refining, refractory dolomite, and flux for open-hearth and blast furnaces.
[e] Includes whiting substitute for pottery and for paint, putty, rubber, and other fillers.
[f] Includes pulverized stone for asphalt, fertilizer, and sundry fillers.
[g] Includes stone for glass factories, magnesium metal, mineral feeds, poultry grit, stock feeds, regrinding, reprocessing, dust for coal mines, and various chemical uses.
[h] Includes stone for asphalt chips, cement blocks, filter beds, stone sand, and unspecified uses.

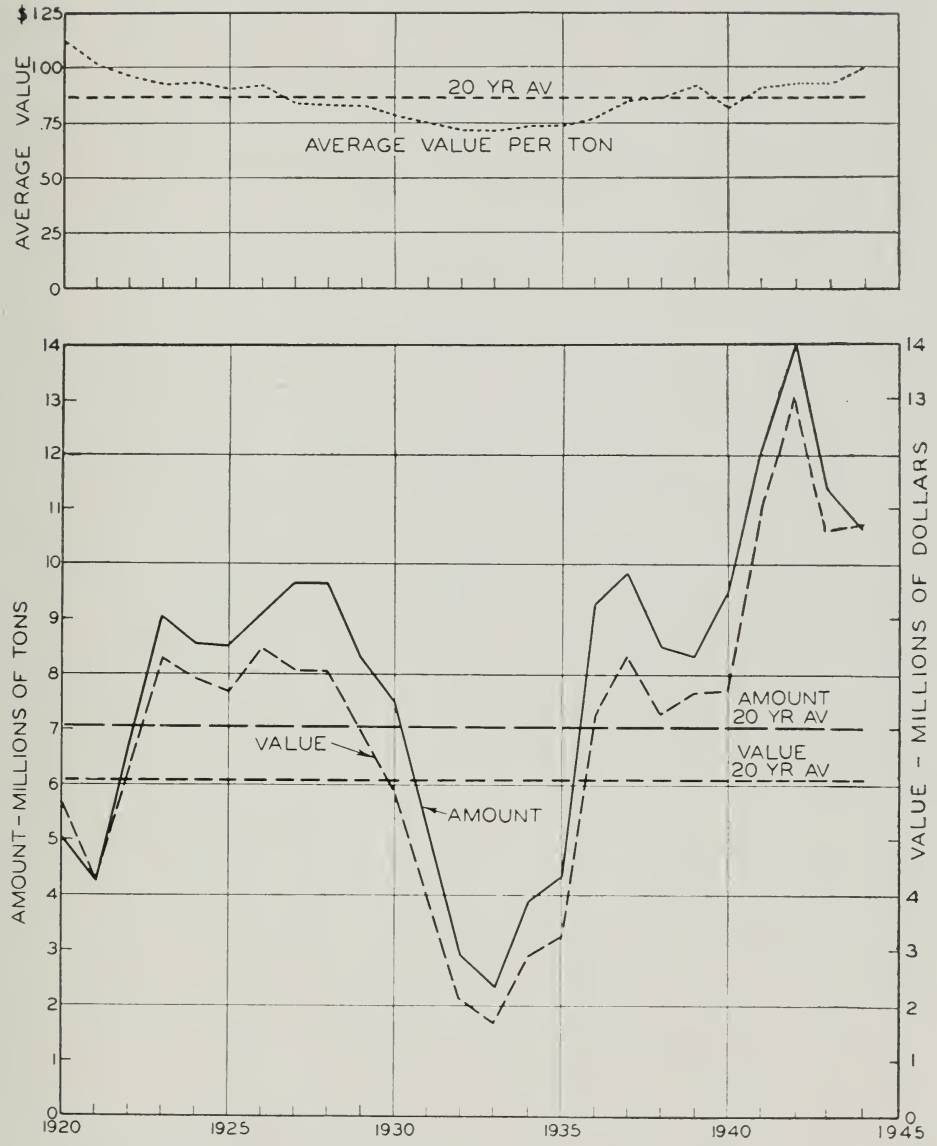

FIG. 7.—Annual production of stone (limestone, dolomite, marl) in Illinois, 1920–1944. (The 20-year average is based on data for 1920–1939 inclusive.)

TABLE 42.—LIMESTONE, DOLOMITE AND MARL, BY KINDS AND BY USES, SOLD OR USED BY PRODUCERS IN ILLINOIS, 1944[a]

Use	Type of operation	Limestone				Dolomite			
		Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants	
				Total	Av.			Total	Av.
Industrial									
Agstone	Commercial	63	2,466,108	$ 2,681,059	$1.09	52	1,560,122	$ 1,544,763	$0.99
Agstone	Gov.-contr.	3	34,153	28,455	.83	1	1,834	1,834	1.00
Agstone-marl	Commercial	2	10,832	10,596	.98	—	—	—	—
Metallurgical and flux[c]	"	2	284,849	295,332	1.04	4	655,213	645,082	.98
Whiting substitute[d]	"	3	10,924	39,537	3.62	—	—	—	—
Miscellaneous fillers[e]	"	2	60,154	200,508	3.33	3	85,843	225,416	2.60
Other industrial uses[f]	"	3	80,267	173,063	2.16	2	19,035	12,621	.66
Total industrial	Both	68	[i] 2,947,287	[i] 3,428,550	1.16	53	2,322,047	2,429,716	1.05
Construction									
Concrete and paving	Commercial	31	1,427,531	1,415,322	.99	31	2,574,248	2,260,193	.88
Concrete and paving	Gov.-contr.	6	29,467	33,748	1.15	6	124,072	102,997	.83
Railroad ballast	Commercial	5	315,749	256,577	.81	10	700,762	519,100	.74
Rubble and veneering stone	"	3	4,217	4,425	1.05	—	[g]	[g]	—
Rubble and veneering stone	Gov.-contr.	1	50	25	.50	—	—	—	—
Flagging	Commercial	3	6,114	6,129	1.00	4	701	2,787	3.98
Riprap	"	14	40,793	47,097	1.15	6	15,965	22,841	1.43
Riprap	Gov.-contr.	2	327	247	.76	2	7,958	13,717	1.72
Other construction uses[h]	Commercial	4	104,606	101,532	.98	4	33,920	32,098	.94
Total construction	Both	42	1,928,854	1,865,102	.97	41	3,457,626	2,953,733	.85
Total Commercial operations	Commercial	65	[i] 4,812,144	[i] 5,231,177	1.09	58	5,645,809	5,264,901	.93
Total Gov.-contr. operations	Gov.-contr.	7	63,997	62,475	.98	8	133,864	118,548	.89
Total		72	[i] 4,876,141	[i] $5,293,652	$1.09	66	5,779,673	$5,383,449	$0.93

[a] Compiled from joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Number of plants reporting production.
[c] Includes stone for aluminum refining, refractory dolomite, and flux for open-hearth and blast furnaces.
[d] Includes whiting substitute for pottery, and for paint, putty, rubber, and other fillers.
[e] Includes pulverized stone for asphalt, fertilizer, and sundry fillers.
[f] Includes stone for glass factories, mineral feeds, poultry grit, regrinding, reprocessing, dust for coal mines, and other chemical uses.
[g] Included in flagging.
[h] Includes stone for asphalt chips, cement blocks, filter beds, stone sand, and unspecified uses.
[i] Includes a small amount of marl.

TABLE 43.—AGSTONE USED IN ILLINOIS, 1943 AND 1944[a]

	1943				1944				
	Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants		Percent change in amount from 1943
			Total	Av.			Total	Av.	
Produced in Illinois:									
Limestone	62	2,001,512	$2,149,907	$1.08	66	2,500,261	$2,709,514	$1.08	+24.9
Dolomite	32	1,137,108	928,828	.82	53	1,561,956	1,546,597	.99	+37.4
Marl	2	7,310	6,950	.95	2	10,832	10,596	.98	+48.2
Total produced in Illinois	96	3,145,930	3,085,685	.98	121	4,073,049	4,266,707	1.05	+29.5
Less marketed in other states	9	75,971	73,692	.97	10	173,211	181,500	1.05	+128.0
Produced and used in Illinois	96	3,069,959	3,011,993	.98	121	3,899,838	4,085,207	1.05	+27.0
Produced in other states and used in Illinois	10	166,518	163,115	.98	8	314,762	303,679	.96	+89.0
Total agstone used in Illinois	106	3,236,477	$3,175,108	$0.98	129	4,214,600	$4,388,886	$1.04	+30.2

[a] From canvass made by Illinois Geological Survey, in cooperation with Illinois Agricultural Association and Midwest Agricultural Limestone Institute.
[b] Number of plants reporting production.

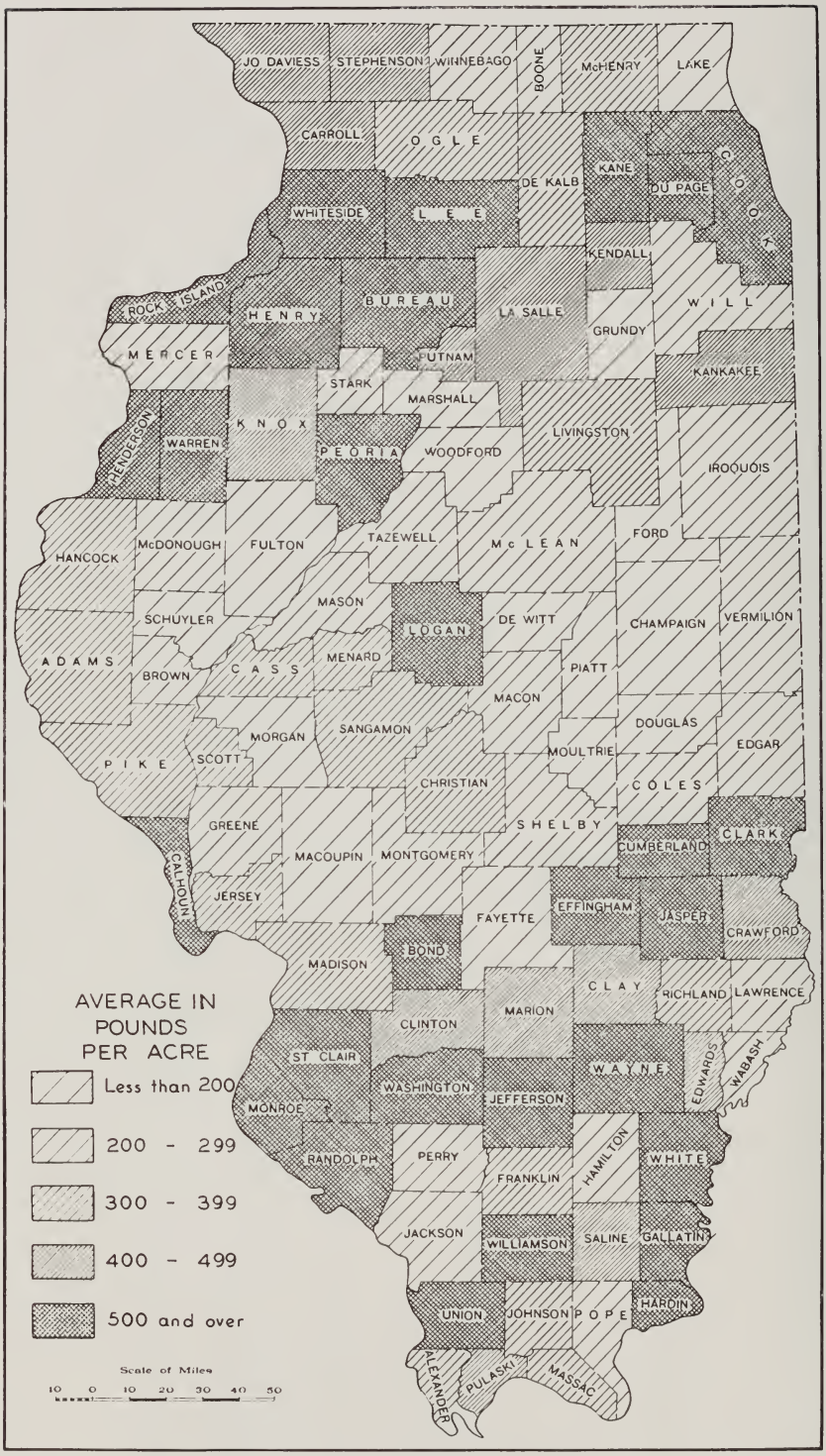

FIG. 8.—Agstone used in Illinois in 1944. County averages are given in pounds per acre of arable land.

Table 44.—Agstone Used in Illinois Annually, 1927–1944[a]

Year	Tons	Value	Av.	Year	Tons	Value	Av.
				1935	379,555	$ 268,139	$0.71
				1936	1,114,466	871,862	.78
1927	647,155	$579,639	$0.90	1937	1,310,513	1,279,981	.97
1928	565,001	511,005	.91	1938	1,251,263	1,247,150	1.00
1929	947,798	843,693	.89	1939	1,497,458	1,318,173	.88
1930	868,426	740,785	.86	1940	2,365,663	1,999,850	.84
1931	268,874	241,376	.90	1941	3,084,855	2,873,536	.93
1932	164,933	140,969	.86	1942	3,866,568	3,600,313	.93
1933	227,466	165,667	.73	1943	3,236,477	3,175,108	.98
1934	491,644	319,604	.65	1944	4,214,600	4,388,886	1.04

[a] U. S. Bur. of Mines, 1927-29; canvass by Ill. Agr. Assoc., 1930; canvass by Ill. Geol. Survey, 1931-44.

The progressive increase in the use of agstone on Illinois farms during the years for which figures are available is shown in table 44.

During 1944, agstone was produced in 48 of the 102 counties of the State. Of the total amount used during the year, 92.5 percent was produced in Illinois.

Table 45 gives the use of agstone by counties in Illinois during 1944, showing the amounts produced in Illinois and in other states. It also shows the arable land in each county and the average quantity of agstone used, in pounds per acre of arable land. These data are from producers who reported sales of agstone in specific counties, or are estimates by county farm advisers, whichever is the larger. Production not accounted for in either of the above figures is given at the bottom of the table marked "counties not specified." The total amount used in Illinois is based on actual deliveries in Illinois reported by producers.

Table 46.—Agstone Produced in Other States and Used in Illinois, 1939–1944[a]
(In tons)

Year	Amount sold in Illinois	Percent of total Illinois consumption
1939	71,775	5.1
1940	106,912	5.9
1941	95,226	3.2
1942	171,035	4.5
1943	166,518	5.3
1944	314,800	7.5

[a] From canvass made by Illinois Geological Survey.

Table 46 gives the total amount of agstone produced in other states but marketed in Illinois. Table 47 gives the total amount produced in Illinois which was marketed in other states.

Table 47.—Agstone Produced in Illinois and Marketed in Other States, 1939–1944[a]
(In tons)

Year	Wisconsin	Iowa	Missouri	Kentucky	Indiana	Other States	Total
1939	—	—	441	4,751	3,527	19,450	28,169
1940	950	—	353	5,450	3,800	15,225	25,778
1941	—	100	867	940	1,800	1,125	4,832
1942	450	—	203	9,700	28,811	19,853	59,017
1943	—	11,000	1,192	1,000	34,579	28,200	75,971
1944	—	7,683	8	8,900	46,302	110,318	173,211

[a] From canvass made by Illinois Geological Survey.

TABLE 45.—AGSTONE USED IN ILLINOIS, BY COUNTIES, 1943 AND 1944[a]

County	Total used in 1943 (Tons)	Tons used in 1944			Acres of arable land (1939 census)	Pounds used per acre	
		Produced in in Illinois	Produced in other states	Total used in Illinois		1943	1944
Adams	65,551	49,000	—	49,000	252,446	519	388
Alexander	8,374	9,200	—	9,200	49,866	336	370
Bond	20,080	39,100	900	40,000	122,224	329	655
Boone	12,342	15,700	—	15,700	115,849	213	272
Brown	15,000	10,000	—	10,000	71,549	419	282
Bureau	32,862	95,800	5,500	101,300	352,777	186	572
Calhoun	15,906	16,000	—	16,000	62,607	508	510
Carroll	34,800	33,000	—	33,000	151,498	459	435
Cass	14,096	25,000	—	25,000	137,405	205	363
Champaign	26,869	29,700	300	30,000	487,052	110	123
Christian	56,176	51,700	—	51,700	317,469	354	320
Clark	52,300	40,300	—	40,300	147,721	708	546
Clay	23,083	13,000	17,100	30,100	147,932	312	407
Clinton	34,732	35,500	1,500	37,000	184,463	377	401
Coles	37,059	30,000	—	30,000	204,186	363	294
Cook	39,140	46,400	—	46,400	174,178	449	532
Crawford	38,755	24,600	5,400	30,000	129,019	601	464
Cumberland	19,413	30,000	—	30,000	111,117	349	540
DeKalb	25,910	50,000	—	50,000	300,180	173	314
DeWitt	4,797	4,500	—	4,500	178,758	54	50
Douglas	10,519	4,000	—	4,000	203,651	103	39
DuPage	26,790	26,100	—	26,100	98,841	542	530
Edgar	35,281	30,000	—	30,000	255,054	277	235
Edwards	19,524	8,500	8,400	16,900	79,811	489	423
Effingham	36,019	32,500	7,000	39,500	153,841	468	516
Fayette	29,604	18,000	2,500	20,500	207,106	286	198
Ford	20,531	20,000	—	20,000	235,032	175	170
Franklin	23,556	13,000	4,200	17,200	101,537	464	338
Fulton	12,492	7,900	3,100	11,000	267,772	93	83
Gallatin	13,325	30,000	—	30,000	102,638	260	580
Greene	20,622	17,700	—	17,700	164,814	250	215
Grundy	27,098	18,000	—	18,000	193,637	280	187
Hamilton	14,184	9,600	6,100	15,700	126,415	224	248
Hancock	44,015	43,000	4,000	47,000	265,043	332	354
Hardin	7,651	31,300	—	31,300	21,367	716	2940
Henderson	30,600	54,700	700	55,400	127,291	481	900
Henry	67,633	75,100	14,900	90,000	327,034	414	550
Iroquois	75,273	56,900	3,100	60,000	536,438	281	224
Jackson	21,745	21,100	—	21,100	147,931	294	286
Jasper	42,923	50,300	—	50,300	174,186	492	620
Jefferson	57,022	22,200	49,800	72,000	146,453	779	984
Jersey	12,300	17,500	—	17,500	104,793	235	334
JoDaviess	25,300	29,200	800	30,000	144,530	350	415
Johnson	10,687	9,000	—	9,000	59,742	358	301
Kane	21,445	71,000	—	71,000	210,186	204	675
Kankakee	81,355	64,000	—	64,000	300,394	542	422
Kendall	30,588	30,000	—	30,000	150,326	407	400
Knox	35,054	29,600	27,600	57,200	253,753	276	452
Lake	7,858	9,600	—	9,600	108,847	144	176
LaSalle	71,965	125,000	—	125,000	506,546	284	493
Lawrence	10,052	11,600	4,000	15,600	122,007	165	253
Lee	77,018	125,000	—	125,000	317,176	486	790
Livingston	34,927	87,700	—	87,700	522,760	134	336
Logan	21,617	79,700	—	79,700	305,432	142	522
McDonough	20,267	29,700	300	30,000	225,530	180	267

[a] Compiled from canvass made by Illinois Geological Survey, in cooperation with Illinois Agricultural Association and Midwest Agricultural Limestone Institute.

TABLE 45.—(Concluded)

County	Total used in 1943 (Tons)	Tons used in 1944			Acres of arable land (1939 census)	Pounds used per acre	
		Produced in in Illinois	Produced in other states	Total used in Illinois		1943	1944
McHenry	27,407	40,200	—	40,200	211,577	259	380
McLean	102,245	75,000	—	75,000	557,076	367	269
Macon	36,074	33,600	200	33,800	263,970	273	254
Macoupin	25,009	16,200	600	16,800	263,157	190	128
Madison	26,106	40,000	—	40,000	256,470	204	311
Marion	38,733	17,200	20,400	37,600	171,342	452	440
Marshall	13,896	10,600	—	10,600	158,028	176	134
Mason	21,231	33,000	—	33,000	225,535	188	293
Massac	20,180	11,000	—	11,000	56,261	717	391
Menard	15,526	21,400	—	21,400	128,395	242	332
Mercer	20,429	17,300	2,700	20,000	190,569	214	210
Monroe	35,712	39,400	—	39,400	144,902	493	544
Montgomery	53,955	35,100	1,600	36,700	248,528	434	297
Morgan	9,300	20,000	—	20,000	220,259	84	182
Moultrie	32,926	16,100	700	16,800	154,637	426	218
Ogle	40,134	60,000	—	60,000	309,633	259	388
Peoria	52,807	75,000	—	75,000	203,084	520	740
Perry	16,170	10,500	6,300	16,800	126,300	256	267
Piatt	11,655	19,600	400	20,000	210,451	111	190
Pike	14,547	40,000	—	40,000	232,460	125	343
Pope	7,856	6,500	—	6,500	52,202	301	249
Pulaski	7,158	12,500	—	12,500	53,830	266	464
Putnam	7,852	11,800	—	11,800	56,148	278	420
Randolph	45,876	43,400	6,600	50,000	196,442	467	510
Richland	16,686	10,900	13,500	24,400	132,767	252	368
Rock Island	30,107	74,300	700	75,000	127,185	474	1180
St. Clair	73,599	78,400	—	78,400	229,600	641	680
Saline	20,581	23,700	—	23,700	99,227	415	477
Sangamon	42,922	60,500	—	60,500	358,668	239	337
Schuyler	7,100	2,500	—	2,500	123,785	115	41
Scott	4,138	15,000	—	15,000	87,070	95	345
Shelby	33,731	36,500	—	36,500	283,990	238	258
Stark	11,676	10,300	2,500	12,800	121,264	192	212
Stephenson	42,000	50,000	—	50,000	212,702	395	470
Tazewell	16,958	30,000	—	30,000	265,832	128	226
Union	19,130	24,700	—	24,700	94,140	407	525
Vermilion	43,750	50,000	—	50,000	390,901	224	256
Wabash	8,705	6,900	3,100	10,000	80,345	217	250
Warren	58,930	74,700	300	75,000	210,953	559	710
Washington	38,281	23,700	31,300	55,000	211,504	362	517
Wayne	48,486	18,500	41,500	60,000	215,527	450	558
White	21,049	49,200	6,200	55,400	189,016	222	570
Whiteside	75,636	82,500	2,500	85,000	274,505	551	618
Will	55,229	39,100	—	39,100	345,147	321	227
Williamson	15,920	24,500	500	25,000	86,222	369	581
Winnebago	35,000	25,000	—	25,000	180,603	388	277
Woodford	19,024	21,200	—	21,200	222,776	171	190
County not specified	140,970	405,300	6,000	411,300	—	—	—
Total	3,236,477	3,899,800	314,800	4,214,600	20,201,195	Av. 318	Av. 417

TABLE 48.—CEMENT, SHIPPED OR USED BY PRODUCERS IN ILLINOIS, 1943 AND 1944[a]

Kind	1943				1944				
	Plants[b]	Amount bbls.[c]	Value at plants		Plants[b]	Amount bbls.[c]	Value at plants		Percent change in amount from 1943
			Total	Av.			Total	Av.	
Standard Portland cement	4	3,861,655	$5,808,128	$1.50	4	3,177,812	$4,881,841	$1.54	—17.7
Special Portland cements:									
High-early-strength, and Portland-puzzolan	3	371,729	750,993	2.02	3	180,713	346,590	1.92	—51.4
Other	2	73,894	98,768	1.34	2	23,301	38,497	1.65	—68.9
Special hydraulic cements:									
Masonry	4	* 280,164	436,318	* 1.56	4	259,459	395,107	1.52	— 7.4
Total cement	4	*4,587,442	$7,094,207	*$1.55	4	3,641,285	$5,662.035	$1.55	—20.6

* Revised figures.
[a] Compiled from canvass made by U. S. Bureau of Mines.
[b] Number of plants reporting production.
[c] Weight per bbl. 376 lbs. or equivalent.

Table 49.—Lime, Sold or Used by Producers in Illinois, 1943 and 1944[a]

Kind and Use	1943*				1944				
	Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants		Percent change in amount from 1943
			Total	Av.			Total	Av.	
Quicklime and refractory dolomite									
Building lime	4	4,828	$ 53,971	$11.15	—	[c]	[c]	—	—
Chemical and industrial lime:									
Paper manufacturing	3	8,188	53,394	6.52	—	[c]	[c]	—	—
Other chemical and industrial uses[d]	7	341,387	2,089,606	6.13	6	249,277	$1,938,937	$7.78	—30.0
Total	8	354,403	2,196,971	6.21	6	249,277	1,938,937	7.78	—30.0
Hydrated lime									
Building lime	4	2,261	24,618	10.85	3	2,807	32,977	11.75	+24.1
Chemical and industrial lime[e]	3	29,190	214,834	7.35	3	28,851	211,149	7.32	— 1.2
Total	4	31,451	239,452	7.63	4	31,658	244,126	7.71	+ 0.7
Total lime	8	385,854	$2,436,423	$6.31	6	280,935	$2,183,063	$7.77	—27.2

* Revised figures.
[a] Compiled from joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Number of plants reporting production during year indicated.
[c] Included in other chemical and industrial uses.
[d] Includes dead-burned (sintered) dolomite.
[e] Includes agricultural lime.

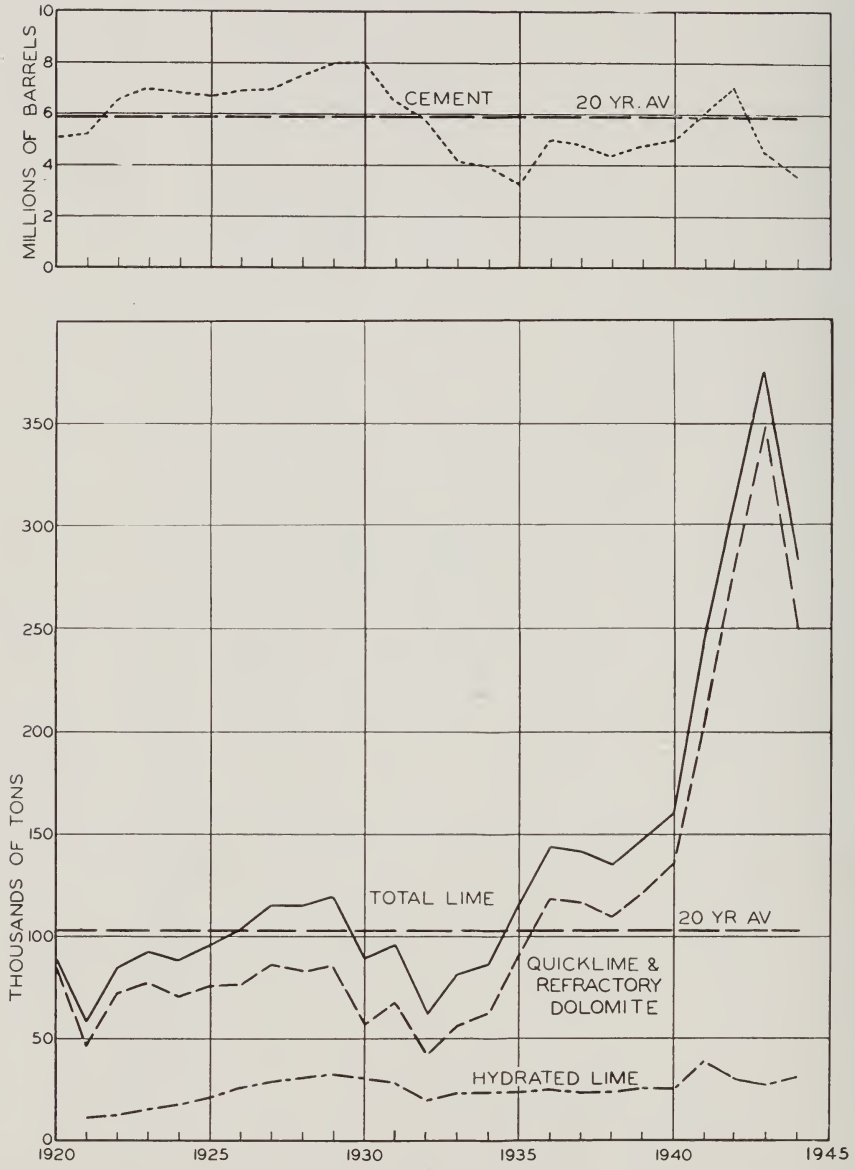

Fig. 9.—Annual shipments of cement and lime by producers in Illinois, 1920–1944. (The 20-year average is based on quantities for 1920–1939 inclusive.)

Cement.—Shipments of cement by producers in Illinois during 1944 amounted to 3,641,285 barrels, valued at the plants at $5,662,035. This was a decrease of 20.6 percent from that of the previous year. Detailed data on cement shipments are given in table 48.

Lime.—Production of lime in Illinois in 1944 amounted to 280,935 tons, valued at $2,183,063. There was a decrease of 27 percent from that of the previous year, as shown in table 49.

Annual shipments of cement and lime by producers in Illinois are shown graphically in figure 9, beginning with 1920, compared to the 20-year average, which is based on shipments for 1920–1939 inclusive.

Mineral wool.—There was a decrease in mineral wool production in 1944 compared to that of the previous year, as shown in table 50.

Ganister and Sandstone

Ganister is a siliceous material found in Union and Alexander counties of southern Illinois. It is used for refractory purposes. (See table 51.)

Sandstone and miscellaneous stone are produced in various parts of the State for riprap, rubble, foundations and road work, mostly by government-and-contractor operations. (See table 51.)

Table 51.—Ganister and Sandstone[a], Sold or Used by Producers in Illinois, 1942–1944[b]
(In tons)

Year	Amount	Value at plants	
		Total	Average
1942[c]	2,948	$9,376	$3.18
1943[c]	1,045	6,557	6.27
1944	548	4,774	8.71

[a] Includes ganister for refractory purposes; and sandstone for rubble, foundations and riprap.
[b] Compiled from join canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[c] In previous reports, included in "Miscellaneous Minerals."

TABLE 50.—MINERAL WOOL, SOLD OR USED BY PRODUCERS IN ILLINOIS, 1943 AND 1944 BY KINDS AND BY USES[a]

Kind	1943				1944				Percent change in amount from 1943
	Plants[b]	Amount	Value at plants		Plants[b]	Amount	Value at plants		
			Total	Av.			Total	Av.	
		tons				tons			
Loose wool	6	1,771	$ 54,884	$30.99	7	1,287	$ 41,914	$32.57	—27.3
Granulated wool	6	26,161	946,856	36.19	7	21,849	788,738	36.10	—16.5
		M. sq. ft.				M. sq. ft.			
Bats and rolls	3	15,894	580,316	36.51	3	9,545	335,961	35.20	—40.0
		board ft.				board ft.			
Felt, blocks, boards, blankets (with metal mesh)	4	*4,431,387	*476,024	.11	3	7,558,664	379,999	.05	+70.6
		tons				tons			
Insulating cement	4	14,984	349,968	23.36	5	3,650	154,344	42.29	—75.6
Other products	3	266	18,291	68.80	—	—	6,064	—	—
Total mineral wool	6	—	*2,426,339	—	8	—	1,707,020	—	[c]—29.6
Use									
Home insulation	6	—	1,727,457	—	8	—	1,185,253	—	[c]—31.4
Industrial insulation	4	—	*698,882	—	5	—	521,767	—	[c]—25.3
Total mineral wool	6	—	*$2,426,339	—	8	—	$1,707,020	—	[c]—29.6

* Revised figures.
[a] Compiled from joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Number of plants reporting production.
[c] Percent change in value from 1943.

CLAYS, CLAY PRODUCTS

Clays and clay products (including fuller's earth and silica refractories) sold and shipped by producers in Illinois in 1944, were valued at $15,904,500, and retained the position of the fourth largest mineral industry in Illinois, ranking next to coal, petroleum, and stone and rock products.

Clays Including Fuller's Earth

Clays (including fuller's earth) which were sold and shipped as such, amounted to 230,800 tons, valued at the mines or pits at $890,000, an increase of 4 percent over the previous year, as shown in table 52. Clays used by their producers in the manufacture of clay products at their own plants are not included but are reported separately in the resultant clay products in table 53.

Comparing the uses of clays, the most significant change was the large increase in nonceramic uses. Clays sold for nonceramic purposes amounted to 109,000 tons, valued at more than $658,000. This was 24.5 percent more than the previous year, and was caused by an increase of 34 percent in clays used for bonding foundry sands, 49 percent increase in that for fillers, and 7 percent increase in clays used for oil refining and cleaners.

Ceramic uses of clays, totaling 121,800 tons, valued at $232,000 showed a decrease of 9 percent. This was due to decrease in clays sold for laying and daubing refractories. Clays sold for manufacture of whiteware and for fire brick and retorts showed increases which were relatively large compared with the production for the previous year.

Clay Products Including Silica Refractories

Clay products (including silica refractories) sold and shipped by producers in Illinois in 1944, with comparative data for 1943, are shown in table 53.

Refractories, clay and silica, amounted to more than 200,000 tons, valued at $4,053,000. This was 23 percent less than in the previous year, due to the completion of various war production plants under construction during 1943.

Structural clay products amounted to 727,500 tons, valued at $4,196,000 a decrease of 12 percent from the previous year. Shipments of common brick were 10 percent more than in 1943, and shipments of sewer pipe, flue lining and wall coping increased 5 percent. All other structural clay products were less in volume than in the previous year because of the sharp decline in civilian construction, due to the war. The value of structural clay products in Illinois in a more normal year is indicated by the average value of the three immediate prewar years, which was $7,340,000.

Whiteware and pottery shipments for 1944 were valued at $6,764,600, a decrease of 8 percent in value from the previous year. Because of the wide variety in sizes of whiteware and pottery, comparison is made by value of products instead of by quantity, Flowerpots increased 23 percent and art pottery 2 percent. All other classifications showed decreases. Some whiteware plants were engaged exclusively in the manufacture of war products during 1944.

Total clays and clay products sold and shipped in Illinois in 1944 were valued at plants at $15,904,500, a decrease of 12 percent from the previous year. This reduction was due primarily to decreases in production of refractories and whiteware.

Annual sales of clays and clay products by producers in Illinois for the past six years are shown graphically in figure 10.

TABLE 52.—CLAYS (INCLUDING FULLER'S EARTH) SOLD AND SHIPPED BY PRODUCERS IN ILLINOIS, 1943 AND 1944, BY KINDS AND BY USES[a]

Kind	1943				1944				
	Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants		Percent change in amount from 1943
			Total	Av.			Total	Av.	
Fire clay	4	164,452	$409,729	$2.49	4	159,425	$425,210	$2.67	− 3.1
Stoneware clay	2	1,948	4,807	2.47	3	13,296	15,697	1.18	+582.5
Kaolin	2	434	3,469	8.00	3	[c] 1,073	[c] 12,381	11.54	+147.2
Shale and surface clay	3	15,786	45,981	2.91	1	14,810	46,825	3.16	− 6.2
	11	182,620	463,986	2.54	10	188,604	500,113	2.65	+ 3.3
Fuller's earth	1	*39,500	*372,024	*9.42	1	42,277	390,346	9.23	+ 7.0
Total clays sold and shipped	12	*222,120	*836,010	*3.75	11	230,881	890,459	3.86	+ 3.9
Use									
Ceramic									
Refractories: laying and daubing	3	119,438	246,927	2.07	3	100,377	193,356	1.93	− 16.0
Mfg. fire brick, retorts, crucibles, etc.	3	5,210	5,225	1.00	4	13,502	27,944	2.07	+159.2
Structural products	2	7,900	10,380	1.31	—	[d]	[d]	—	—
Whiteware and pottery	3	1,948	4,807	2.47	5	7,916	10,851	1.37	+306.4
	7	134,496	267,339	1.99	7	121,795	232,151	1.91	− 9.4
Nonceramic									
Bonding foundry sands	3	32,338	150,666	4.66	4	43,289	163,095	3.77	+ 33.9
Fillers, etc.	4	15,786	45,981	2.91	4	23,520	104,867	4.46	+ 49.2
Oil refining, cleaners	1	*39,500	*372,024	*9.42	1	42,277	390,346	9.23	+ 7.0
	7	*87,624	*568,671	*6.50	7	109,086	658,308	6.03	+ 24.5
Total clays sold and shipped	12	*222,120	*$836,010	*$ 3.75	11	230,881	$890,459	$3.86	+ 3.9

* Revised figures.
[a] Compiled from joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Number of plants reporting production during year indicated.
[c] Includes potter's clay.
[d] Included with Refractories—Mfg. fire brick, retorts, crucibles, etc.

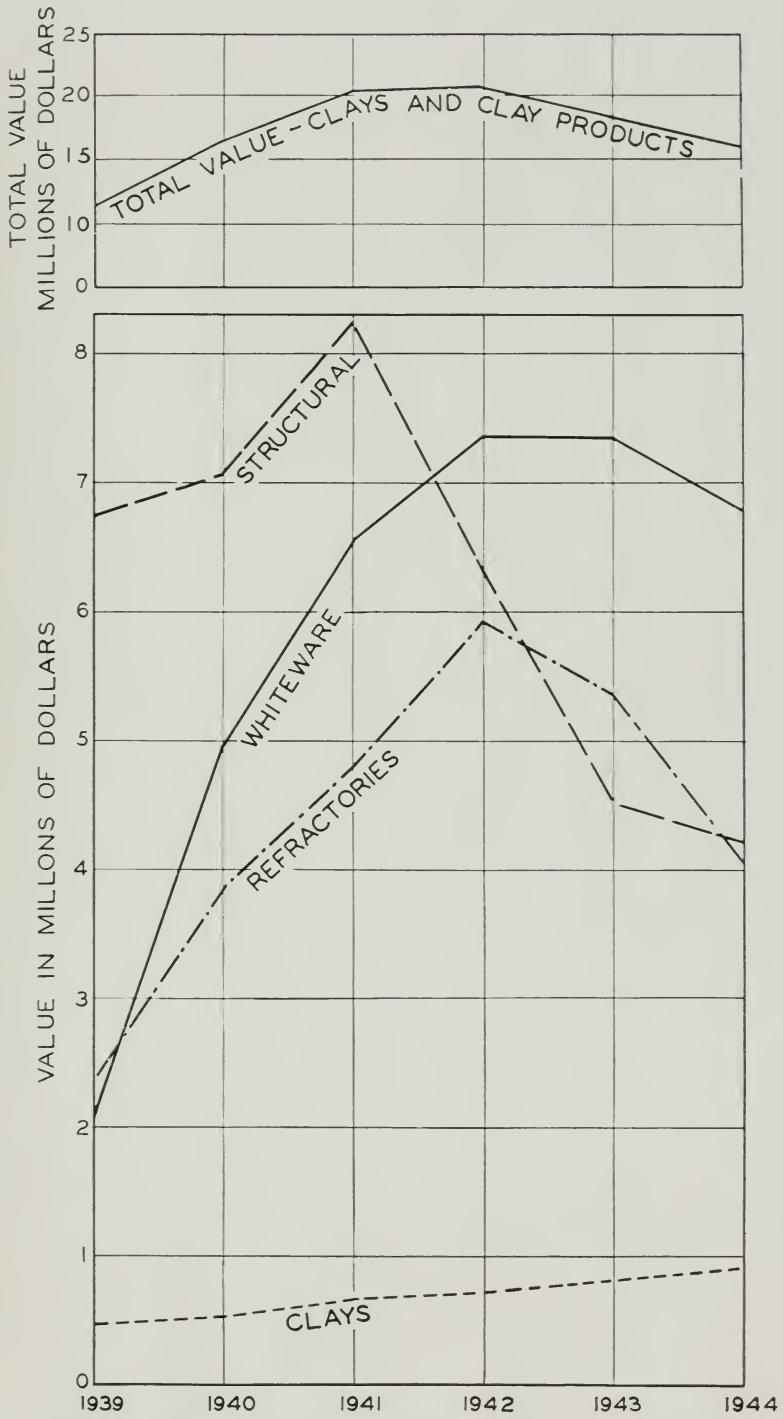

Fig. 10.—Annual sales of clays and clay products by producers in Illinois, 1939–1944.

TABLE 53.—CLAY PRODUCTS (INCLUDING SILICA REFRACTORIES) SOLD AND SHIPPED BY PRODUCERS IN ILLINOIS, 1943 AND 1944[a]

Kind	1943				1944				
	Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants		Percent change in amount from 1943
			Total	Av.			Total	Av.	
Refractories—clay and silica									
Firebrick and shapes	7	219,258	$4,361,933	$19.89	7	166,897	$3,128,652	$18.75	−23.9
Plastic and castable refractories	4	13,593	506,598	37.27	5	11,715	451,045	38.50	−13.8
Cements and mortars	6	11,788	190,231	16.14	6	8,267	161,478	19.53	−29.9
Other refractories	8	15,723	320,730	20.40	5	13,142	312,212	23.83	−14.0
Total refractories	12	260,362	5,379,492	20.66	11	200,021	4,053,387	20.26	−23.2
Structural clay products		thous.				thous.			
Common brick	31	174,500	1,965,500	11.26	22	191,295	2,257,741	11.80	+ 9.7
Face brick	19	28,500	443,800	15.57	10	17,206	304,597	17.70	−39.6
Paving block	3	4,800	110,100	22.94	2	576	14,836	25.76	−88.0
		tons				tons			
Total (in equivalent tons)	34	524,600	2,519,400	4.80	23	523,267	2,577,174	4.93	− 0.3
Drain tile	14	97,700	800,900	8.20	12	77,439	617,862	7.98	−20.7
Structural tile	16	63,400	381,800	6.02	14	40,335	266,849	6.62	−36.4
Sewer pipe, flue lining, wall coping	3	17,800	383,200	21.53	2	18,641	430,898	23.12	+ 4.7
Terra cotta and glazed block	4	[d] 5,500	[d] 109,500	19.91	—	[c]	[c]	—	—
Other structural products	3	121,100	320,500	2.65	7	67,801	303,281	4.47	−44.0
Total structural clay products	46	830,100	4,515,300	5.44	35	727,483	4,196,064	5.77	−12.4
Whiteware and pottery									[e]
Flowerpots	3	—	188,465	—	3	—	230,995	—	+22.6
Stoneware and kitchenware	4	—	1,403,600	—	4	—	1,194,072	—	−14.3
Dinnerware and art china	3	—	426,694	—	3	—	422,365	—	− 1.0
Art pottery	5	—	1,548,800	—	5	—	1,576,542	—	+ 1.8
Vitreous-china plumbing fixtures	3	—	2,637,500	—	3	—	2,566,369	—	− 2.7
Porcelain and other whiteware	5	—	1,154,500	—	4	—	774,277	—	−32.9
Total whiteware	17	—	7,359,559	—	16	—	6,764,620	—	− 8.1
Total clay products	74	—	17,254,351	—	62	—	15,014,071	—	−13.0
Total clays and clay products (Tables 52 and 53)	79	—	*$18,090,361	—	67	—	$15,904,530	—	−12.1

* Revised figures.
[a] Compiled from canvass made by Illinois Geological Survey.
[b] Number of plants reporting production.
[c] Included in "Other structural products."
[d] Includes facing block.
[e] Percent change in value from 1943.

TABLE 54.—VALUE OF BUILDING PERMITS ISSUED IN ILLINOIS, BY MONTHS AND BY TYPE, IN 1944[a]

Month	Number of dwelling units		Valuation (In thousands of dollars)					
			All building construction (including additions, etc.)		New residential buildings		New non-residential buildings	
	Total	Federal	Total	Federal	Total	Federal	Total	Federal
January	373	0	4,152	1,390	1,700	0	1,572	1,325
February	459	0	3,864	191	2,055	0	1,151	178
March	432	0	3,969	0	1,988	0	505	0
April	709	120	5,448	845	2,977	193	1,334	648
May	692	0	7,072	1,491	2,967	0	2,183	1,487
June	597	0	12,008	1,026	2,308	0	8,043	939
July	354	0	4,041	314	1,562	0	1,027	277
August	746	400	7,127	2,648	2,885	1,473	2,626	1,171
September	471	0	4,787	724	1,811	0	1,862	707
October	812	60	7,711	1,706	3,472	193	2,821	1,419
November	357	0	5,247	592	1,655	0	2,260	581
December	494	0	4,667	340	2,371	0	1,137	323
Total 1944	6,496	580	70,093	11,267	27,751	1,859	26,521	9,055
Total, 1943	6,697	1,500	85,378	46,026	29,476	7,597	44,582	38,319
Percent change from 1943			—17.9		—5.8		—40.5	

[a] As reported to U. S. Dept. of Labor, Bureau of Labor Statstics. See monthly reports on "Building Construction" for 1944.

BUILDING CONSTRUCTION

Building activity in 1944 was characterized by a sharp decline in construction by the Federal Government. Only three new projects were listed under this type of construction, although each month of the year showed some activity in additions and extensions. In addition to the sharp decline in federally sponsored construction it is noteworthy that private residential building showed only a slight decline. The month-by-month record is shown in table 54.

TABLE 55.—SILICA SAND, SOLD OR USED BY PRODUCERS IN ILLINOIS, 1943 AND 1944[a]

Use	Type of operation	1943				1944				Percent change in amount from 1943
		Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants		
				Total	Av.			Total	Av.	
Industrial sands:										
Glass sand	Commercial	4	1,004,796	$1,425,895	$1.42	4	985,059	$1,491,255	$1.51	— 2.0
Steel molding sand	"	*11	* 2,285,092	*2,813,907	*1.24	12	2,039,163	2,404,148	1.18	—10.8
Blast, grinding and polishing sands	"	3	186,662	553,844	2.97	4	182,535	540,960	2.96	— 2.2
Fire or furnace sand	"	3	46,399	53,024	1.12	5	35,254	53,832	1.53	—24.0
Engine and filter sands	"	3	10,755	17,372	1.62	—	[c]	[c]	—	—
Other silica sand[d]	"	2	58,857	103,499	1.76	3	72,242	126,986	1.76	+22.7
Total	Commercial	*12	*3,592,561	*4,967,541	*1.38	12	3,314,253	4,617,181	1.39	— 7.8
Construction sands:										
Structural and paving sands	Commercial	2	21,183	32,941	1.56	2	16,932	25,798	1.52	—20.0
Total silica sand	Commercial	*12	*3,613,744	*$5,000,482	*$1.38	12	3,331,185	$4,642,979	$1.39	— 7.8

* Revised figures.
[a] Compiled from joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Number of plants reporting production during year indicated.
[c] Included in "Fire or furnace sand."
[d] Except sand ground for silica flour, which is given in table 56, "Ground Silica."

SAND AND GRAVEL

Silica sand.—Production of silica sand amounted to 3,331,185 tons valued at $4,642,979 (table 55). This was a decrease in amount of nearly 8 percent under that of 1943, but Illinois continued to hold first place among the states in the production of silica sand for steel molding sand and for glass sand.

Ground silica.—During 1944 the Illinois production of ground silica or, silica flour, made by fine grinding of washed silica sand, amounted to 156,353 tons, valued at the plants at $1,076,785. As shown in table 56 this was a decrease of 10 percent in amount from the previous year.

Tripoli ("amorphous" silica).—Production of tripoli ("amorphous" silica) in Illinois during 1944 amounted to 10,431 tons, valued at the plants at $174,732 as given in table 57. Illinois ranked first among the states in production of tripoli. This material is used as an abrasive, polish, filler, and for many other purposes.

Other sand and gravel.—Table 58 shows sand (other than silica sand) and gravel, sold or used by producers in Illinois in 1943 and 1944. The total of all sand and gravel produced in 1944 amounted to 11,961,345 tons, valued at the plants at $8,909,951 which was a decrease of 14 percent in amount from 1943.

Commercial and government-and-contractor operations.—About 650,000 tons, or 5 percent of the sand and gravel produced in Illinois during 1944 came from government-and-contractor operations: The State of Illinois, counties, townships, and municipalities produced either by themselves or by contractors expressly for their use. Pur-

TABLE 56.—GROUND SILICA, SOLD OR USED BY PRODUCERS IN ILLINOIS, 1943 AND 1944[a]

Use	1943			1944			Percent change in amount from 1943
	Amount tons	Value at plants		Amount tons	Value at plants		
		Total	Av.		Total	Av.	
Abrasive	53,347	$358,256	$6.72	46,853	$317,759	$6.78	—12.2
Enamel and glass	5,804	42,844	7.38	6,111	45,497	7.42	+ 5.3
Foundry and filler	*77,190	*540,463	*7.00	71,029	500,694	7.05	— 8.0
Pottery, porcelain and tile	26,479	199,886	7.55	15,067	94,906	6.30	—43.1
Other uses	*11,034	* 77,320	*7.00	17,293	117,929	6.86	+56.7
Total	173,854	$1,218,769	$7.01	156,353	$1,076,785	$6.88	—10.1

* Revised figures.
[a] Compiled from joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.

TABLE 57.—TRIPOLI ("AMORPHOUS" SILICA), SOLD OR USED BY PRODUCERS IN ILLINOIS, 1943 AND 1944[a]

Use	1943			1944			Percent change in amount from 1943
	Amount tons	Value at plants		Amount tons	Value at plants		
		Total	Av.		Total	Av.	
Abrasive	3,182	$ 51,889	$16.31	3,210	$53,577	$16.69	+ 0.9
Filler and other uses	7,021	116,869	16.65	7,221	121,155	16.78	+ 2.8
Total	10,203	$168,758	$16.54	10,431	$174,732	$16.75	+ 2.2

[a] Compiled from joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.

TABLE 58.—SAND (OTHER THAN SILICA SAND) AND GRAVEL, SOLD OR USED BY PRODUCERS IN ILLINOIS, 1943 AND 1944[a]

Kind and Use	Type of operation	1943				1944				Percent change in amount from 1943
		Plants[b]	Amount tons	Value at plants		Plants[b]	Amount tons	Value at plants		
				Total	Av.			Total	Av.	
Sand (other than silica sand)										
Industrial Sands										
Natural-bonded molding sand	Commercial	8	81,375	$ 104,494	$1.28	6	78,889	$ 90,318	$1.14	— 3.1
Engine sand	"	14	[c]160,397	[c]69,307	.43	12	176,970	85,871	.49	+10.3
Total	Commercial	22	241,772	173,801	.72	18	255,859	176,189	.69	+ 5.8
Construction Sands										
Structural sands[d]	Commercial	56	1,914,595	853,053	.45	59	1,668,437	817,886	.49	—12.9
Paving and highway-structures sand	"	46	873,656	528,483	.60	37	667,035	348,950	.52	—23.7
Paving and highway-structures sand	Gov.-Contr.	5	21,537	15,457	.72	8	23,204	11,877	.51	+ 7.7
Railroad-ballast sand	Commercial	7	341,699	97,317	.28	5	289,680	76,958	.27	—15.2
Other construction sands	"	9	159,132	95,501	.60	7	34,506	14,305	.41	—78.3
Total	Both	88	3,310,619	1,589,811	.48	76	2,682,862	1,269,976	.47	—21.0
Total sand (other than silica sand)	Commercial	83	3,530,854	1,748,155	.49	74	2,915,517	1,434,288	.49	—20.0
Total sand (other than silica sand)	Gov.-Contr.	5	21,537	15,457	.72	8	23,204	11,877	.51	+ 7.7
Total sand (other than silica sand)	Both	88	3,552,391	1,763,612	.50	82	2,938,721	1,446,165	.49	—17.4
Gravel										
Structural gravel[d]	Commercial	63	1,993,963	1,103,387	.55	69	1,766,508	930,440	.53	—11.4
Structural gravel[d]	Gov.-Contr.	4	19,095	3,991	.21	2	5,800	1,950	.33	—69.6
Paving and highway-structures gravel	Commercial	*75	*2,192,672	*1,053,834	*.48	76	1,703,067	892,450	.52	—22.3
Paving and highway-structures gravel	Gov.-Contr.	36	662,275	315,802	.48	42	618,645	357,520	.58	— 6.6
Railroad-ballast gravel	Commercial	*18	*1,680,907	*729,528	*.43	13	1,487,972	596,952	.40	—11.5
Novaculite gravel (paving)	"	1	28,422	20,873	.73	1	21,443	17,154	.80	—24.6
Other gravel	"	11	107,475	71,106	.66	4	88,004	24,341	.28	—18.1
Total	Both	*147	*6,684,809	*3,298,521	*.49	151	5,691,439	2,820,807	.50	—14.9
Total gravel	Commercial	*108	*6,003,439	*2,978,728	*.50	107	5,066,994	2,461,337	.49	—15.6
Total gravel	Gov.-Contr.	39	681,370	319,793	.47	44	624,445	359,470	.58	— 8.4
Total gravel	Both	*147	*6,684,809	*3,298,521	*.49	151	5,691,439	2,820,807	.50	—14.9

Total sand (other than silica sand)and gravel	Commercial	*128	*9,534,293	*4,726,883	*.50	119	7,982,511	3,895,625	.49	—16.3
Total sand (other than silica sand) and gravel	Gov.-Contr.	40	702,907	335,250	.48	46	647,649	371,347	.57	— 7.9
Total sand (other than silica sand) and gravel	Both	*168	*10,237,200	*5,062,133	*.49	165	8,630,160	4,266,972	.49	—15.7
Summary—Sand and Gravel (including silica sand) (*Tables 55 and 58*)										
Total industrial sands (including silica sand)	Both	*34	*3,834,333	*5,141,342	*1.34	30	3,570,112	4,793,370	1.34	— 6.9
Total construction sands and gravel	Both	*162	*10,016,611	*4,921,273	*.49	159	8,391,233	4,116,581	.49	—16.2
Total sand and gravel (Tables 55 and 58)	Both	*180	*13,850,944	*$10,062,615	*$0.73	177	11,961,345	$8,909,951	$0.74	—13.6

* Revised figures.
[a] Compiled from joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[b] Number of plants reporting production.
[c] Includes filter sands.
[d] Excludes highway structures

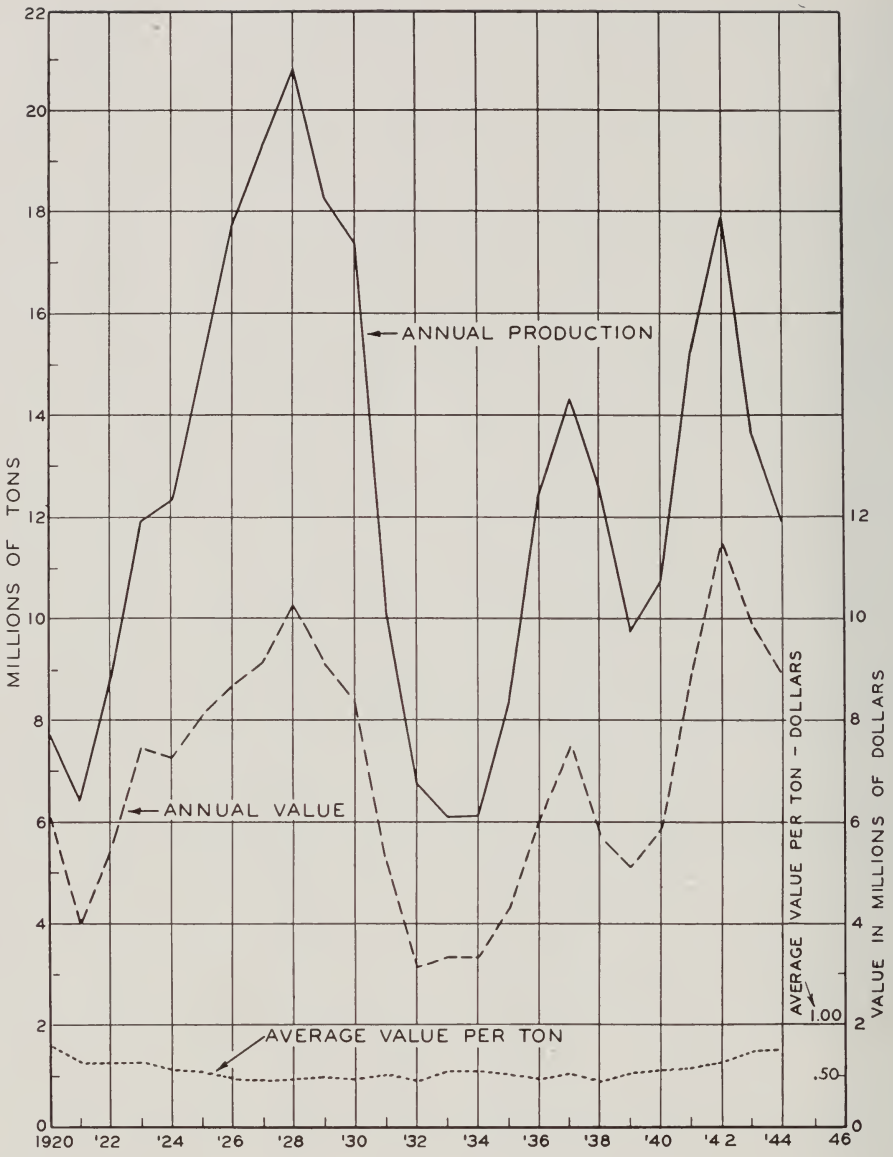

Fig. 11.—Annual production and value of sand and gravel and silica sand in Illinois, 1920–1944.

chases by government agencies from commercial producers are included in commercial operations.

Annual production and value of sand and gravel (including silica sand) in Illinois is shown graphically in figure 11 for each year since 1920. The average value per ton is also given for each year. The large increase since 1939 is notable. The annual value for 1942, which established an all-time record, was the result of the great increases in the use of silica sand for steel molding sand and the large increases in the use of other sands for various industrial needs. All of these industrial uses were greatly affected by the production of war materials.

FLUORSPAR

Fluorspar Industry in 1944

PRODUCTION

According to the Bureau of Mines, United States Department of the Interior, the fluorspar industry in the United States produced and shipped more than 400,000 tons of finished fluorspar in 1944 for the second consecutive year (table 59). Both production and shipment of finished fluorspar reached new peaks in 1944, when consumption for the first time exceeded 400,000 tons.

Production of finished fluorspar from domestic ore was 413,781 net tons in 1944 as compared with 406,016 net tons in 1943, or an increase of 2 percent over 1943, which was itself a record year. The output of metallurgical-grade fluorspar was greater than the requirements, and ceramic-grade fluorspar was again adequate for the demand in that field. However, the consumption of acid-grade fluorspar increased so steadily that production was unable to keep pace except by milling some acid-grade Mexican ore which is of substantially higher purity than the domestic milling ore and so lends itself to a much higher recovery. From this Mexican ore, flotation mills in the United States recovered 4,855 tons of concentrates in 1944, which were not included in the statistics on production or shipments.

In spite of the fact that shipments in Illinois dropped 11 percent from its 1943 record, which reached an all-time high of 198,789 net tons, to 176,259 tons, it not only maintained its rank as the chief producing state in 1944, but also supplied 43 percent of the total shipments, as shown in table 59. Colorado, New Mexico, Texas and Utah established new records in 1944, and Kentucky after declining for two successive years showed a slight upward trend in 1944.

CONSUMPTION

According to a recent article in Chemical and Metallurgical Engineering, few chemicals have played such an important role in our war-effort as the little publicized fluorine derivatives.[1] The rapid advancement in fluorine technology is evidenced by the fact that the output of all fluorine chemicals, exclusive of the fluosilicates, was approximately 6,500 tons in 1929, 11,000 tons for 1939, and 53,000 tons for 1944 as shown in table 60.

[1] Callaham, John R., Fluorine Industry: Chemical and Metallurgical Engineering, March 1, 1945.

Table 59.—Fluorspar Shipped from Mines in the United States, 1943 and 1944, by States

State	1943			1944			Percent of total amount
	Short tons	Value		Short tons	Value		
		Total	Average		Total	Average	
Illinois	198,789	$6,292,789	$31.66	176,259	$5,954,991	$33.79	42.6
Kentucky	109,849	3,122,513	28.43	112,791	3,363,788	29.82	27.3
Colorado	49,145	1,164,868	23.70	65,209	1,604,043	24.60	15.8
New Mexico	37,050	986,094	26.62	42,973	1,205,830	28.06	10.4
Nevada	8,653			7,293			1.8
Utah	51	188,619	21.34	3,466	252,071	23.37	.8
California	134			26			
Texas	960	19,281	20.08	4,769	100,381	21.05	1.1
Arizona	1,328	26,441	19.91	976	21,983	22.52	.2
Tennessee	57	1,650	28.95	—	—	—	—
Wyoming	—	—	—	19	400	21.05	—
Total	406,016	$11,802,255	$29.07	413,781	$12,503,487	$30.22	100.0

Table 60.—Production of Hydrogen Fluoride, Calculated 100 Percent, in Tons[a]

Year	Aqueous Acid	Anhydrous Acid	Total Hydrogen Fluoride Generated[d]
1931	No data	500	5,000
1933	[b]1,358	No data	3,300
1935	[b]1,497	No data	5,400
1937	[b]2,198	No data	10,000
1939	[b]2,173	No data	11,000
1940	No data	No data	15,500
1943	[c]11,800	[e]9,200	47,000
1944 (est.)	[c]12,100	[e]24,900	53,000

[a] Callaham, Op. cit.
[b] Production for sale, Bureau of the Census.
[c] Total production exclusive of that going into aluminum fluoride and synthetic cryolite, War Production Board. Probably 3,000-4,000 tons for sale.
[d] Calculated from consumption of acid-grade spar, Bureau of Mines figures. Includes hydrogen fluoride used in the production of synthetic cryolite, aluminum fluoride, and all other hydrogen fluoride derivatives. Factor: Acid-spar ÷ 2.4 = hydrogen fluoride 100 percent.
[e] War Production Board.

The total national consumption of fluorspar in 1944, as shown in table 61, increased to 410,170 net tons over 1943 consumption of 388,885 tons. Production of basic open-hearth and basic electric steels in 1944 showed an increase of 2 percent over 1943, while consumption of fluorspar in steel mills (230,201 tons) dropped 2 percent from the 1943 consumption.

Consumption of both domestic and foreign fluorspar in 1943 and 1944 is summarized by industries and by states in tables 61 and 62 respectively, and consumption of domestic fluorspar only is summarized by use in table 63 and by grade of fluorspar and industry in table 64 for the same years. Table 65 shows the comparative consumption by Illinois and by the nation for six years, 1939-1944.

The manufacture of hydrofluoric acid, used in the manufacture of artificial cryolite and aluminum fluoride, high octane gasoline, refrigerating mediums (the freons), insecticides, and other chemical products necessary for the successful prosecution of the war, accounted for 32 percent of the total consumption of fluorspar in 1944, or 129,553 tons. This was an increase of 3 percent over 1943. See table 61.

Although its entire output is now put into military and essential civilian needs, anhydrous hydrofluoric acid seems to be mushrooming into increasingly greater importance. The largest single use of this acid at present is as a catalyst in the production of aviation alkylate used in the manufacture of high-octane gasoline. Its advantage over sulphuric acid as a catalyst results from the higher process temperature that can be used and the ease of acid recovery by distillation. The chief disadvantage at present is the cost involved and the problem of corrosion. For these reasons many expect hydrofluoric and sulphuric acid to start the post-war period on an equal basis as catalysts. Anhydrous hydrofluoric acid is also used in the production of freons and for secret military purposes. In addition to the use of freons as refrigerants, they have gained prominence as the propellent in the insecticidal bombs used in the South Pacific. Post-war prospects in both fields are considered promising.

Aqueous hydrofluoric acid is used directly in such processes as pickling stainless steel and in cleaning sand from metal casings, although approximately 90 percent of it goes into the production of fluorine chemicals.

The superiority of the United States in the air is dependent upon aluminum, which in turn must rely upon the two fluorine compounds aluminum fluoride and sodium alu-

TABLE 61.—FLUORSPAR (DOMESTIC AND FOREIGN) CONSUMED AND IN STOCK IN THE UNITED STATES, 1943 AND 1944, BY INDUSTRIES, IN TONS

Industry	1943			1944		
	Consumption	Stocks at consumers' plants Dec. 31	In transit to consumers' plants Dec. 31	Consumption	Stocks at consumers' plants Dec. 31	In transit to consumers' plants Dec. 31
Basic open-hearth steel	205,676	61,195	3,008	201,788	56,956	6,566
Electric-furnace steel	28,236			27,307		
Bessemer steel	236			1,106		
Iron foundry	3,378	1,155	104	4,101	1,345	—
Ferro-alloys	3,882	2,331	—	3,714	876	—
Hydrofluoric acid	113,614	27,951	1,443	129,553	27,249	1,325
Primary aluminum	2,758	1,008	55	1,487	696	—
Primary magnesium	3,025	1,026	158	5,594	943	—
Glass	20,592	6,184	283	27,315	5,621	950
Enamel	1,726	1,065	132	2,547	1,202	98
Welding rod	2,286	150	—	1,928	175	1
Cement	262	1,046	—	421	1,278	—
Miscellaneous	3,214	2,822	348	3,309	2,105	101
Total	388,885	105,933	5,531	410,170	98,446	9,041

TABLE 62.—FLUORSPAR (DOMESTIC AND FOREIGN) CONSUMED IN THE UNITED STATES, 1943 AND 1944, BY STATES, IN TONS

State	1943	1944	State	1943	1944
Alabama	13,532	11,120	Illinois	87,702	65,839
Georgia			Indiana	20,287	26,414
Arizona			Kentucky	10,924	8,814
Kansas			Maryland		
Nebraska		609	Massachusetts	1,687	1,488
Nevada	694		Rhode Island		
South Dakota			Michigan	15,754	13,705
Wyoming			Minnesota	3,629	2,082
Arkansas			Wisconsin		
Louisiana	555		Missouri	3,835	3,186
Mississippi		322	New York	17,749	18,774
North Carolina			Ohio	68,610	69,137
Florida			Oklahoma	595	3,201
California	7,877	10,160	Oregon	1,978	3,162
Colorado	9,627	11,844	Washington		
Iowa			Pennsylvania	85,371	104,608
Utah			Tennessee	1,175	1,726
Connecticut	763	1,317	Texas	3,708	11,334
Delaware	26,454	34,924	Virginia	311	302
District of Columbia			West Virginia	6,068	6,102
New Jersey			Total	388,885	410,170

minum fluoride (or cryolite). Aluminum fluoride is used as the flux in electrolytic reduction of alumina, and cryolite is the indispensable electrolyte in the reduction of alumina. However, unlike aluminum fluoride, cryolite has additional uses, a very important one of which is in insect control. It has been estimated that as much as 7,500 tons will be used in 1945 for this purpose.

In an article on "Fluorine Industry Molds a Postwar Career from Wartime Service,"[2] the author emphasizes the importance of fluorine compounds as sand-

[2] Callaham, Op. Cit.

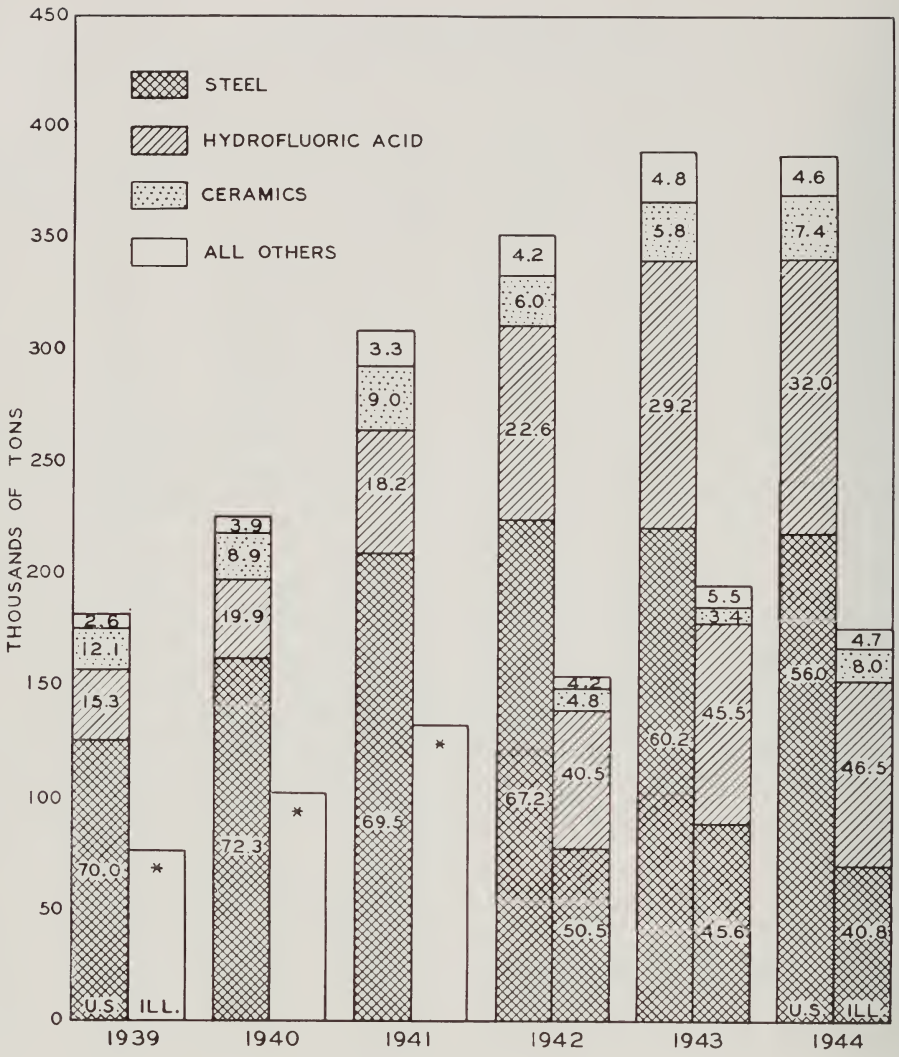

FIG. 12.—Fluorspar consumption, by uses, for United States and Illinois.

agents in the casting of aluminum and magnesium. These agents fill the voids in sand molds by volatilizing when heated, thus preventing oxidation of the metal. Roughly 1 to 3 percent by weight, of either ammonium fluosilicate or ammonium bifluoride and fluoborate is used in the sand mixture. Lithium fluoride has made aluminum welding practical because it serves as a powerful fluxing agent, is non-hygroscopic and highly insoluble. It is also an ingredient of phosphorescent pigment for airplane instrument dials.

Sodium fluoride is used in the production of rimmed steel where heats are sluggish and might result in second-grade ingots. Potassium fluoride, bifluoride, and fluoborate have become important as fluxes in silver soldering. Metal fluoborates, of which lead is the best known, are used in electroplating.

Thus the past ten years have shown a striking development in the field of fluorspar derivatives. Although these products have been largely restricted to wartime needs, civilian demands promise to be heavy in the post-war period. Most of the new uses for

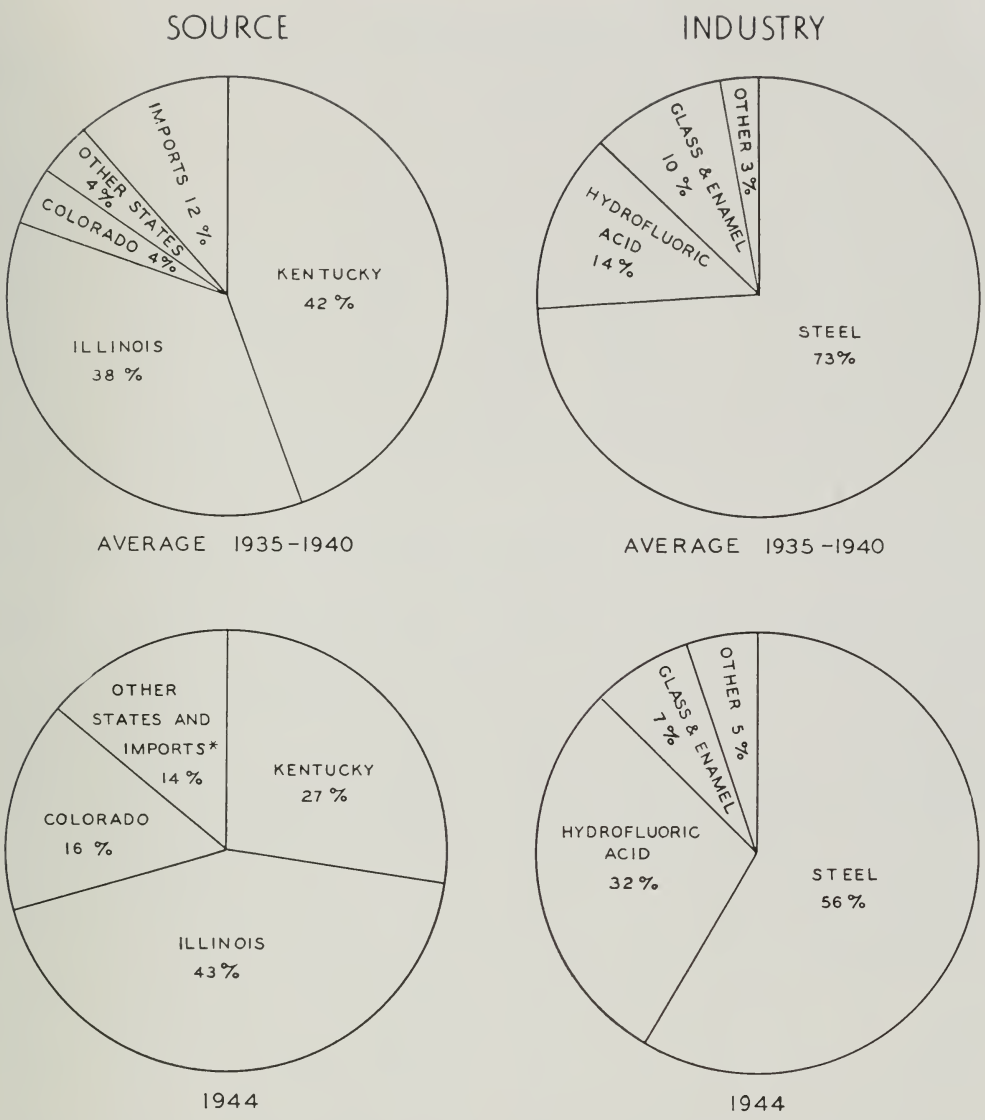

FIG. 13.—Average annual fluorspar consumption (of both domestic and foreign fluorspar) in the United States, 1935–1940 compared with consumption for 1944, by sources and by consuming industries.

fluorspar compounds are useful in peace as they are in war and hence will continue to utilize large tonnages of this mineral. Although the steel industry still consumes the greater part of fluorspar, demands from the ceramic industry are increasing so rapidly, as they plan for civilian needs, that there is some concern lest our ore reserves are none too large. However, recent investigations made jointly by the United States Geological Survey and the Bureau of Mines show a probable reserve of more than 14,000,000 tons containing an average of 45 to 55 percent CaF_2 and more than 10,000,000 tons of additional material averaging 15 to 35 percent CaF_2. This looks encouraging in view of the fact that in 1936 our reserves were roughly estimated to be about 5,000,000 tons.

The flotation processes for treating nonmetallic minerals have lately become very important because they make it economically

TABLE 63.—FLUORSPAR SHIPPED FROM MINES IN THE UNITED STATES, 1943 AND 1944, BY USES

Use	1943			1944		
	Short tons	Value		Short tons	Value	
		Total	Average		Total	Average
Steel	220,809	$6,006,251	$27.20	219,361	$6,087,077	$27.75
Iron foundry	3,398	85,728	25.23	4,044	109,869	27.17
Glass	19,487	582,173	29.87	27,174	892,761	32.85
Enamel	1,572	50,620	32.20	2,685	90,444	33.68
Hydrofluoric acid	123,680	4,046,231	32.72	121,084	4,251,686	35.11
Miscellaneous	19,956	598,627	30.00	13,057	416,672	31.91
Government stock pile	8,070	185,652	23.01	24,396	589,069	24.15
Foreign consumption	9,044	246,973	27.31	1,980	65,909	33.29
Total	406,016	$11,802,255	$29.07	413,781	$12,503,487	$30.22

TABLE 64.—FLUORSPAR SHIPPED FROM MINES IN THE UNITED STATES, 1943 AND 1944, BY GRADES AND BY INDUSTRIES, IN TONS

Grade and industry	1943	1944
Fluxing gravel and foundry lump:		
Ferrous	215,530	210,930
Nonferrous	3,313	1,264
Cement	1,094	646
Miscellaneous	205	389
Government stock pile	4,374	23,824
Exported	1,945	55
	226,461	237,108
Acid lump:		
Ferrous	20	20
Nonferrous	1	—
Hydrofluoric acid	547	1,572
	568	1,592
Ground:		
Ferrous	95	126
Nonferrous	1,500	1,480
Glass and enamel	14,077	15,998
Hydrofluoric acid	1,150	1,060
Miscellaneous	3,006	2,219
Exported	435	448
	20,263	21,331
Flotation concentrates:		
Ferrous	[a] 13,351	[a] 14,589
Nonferrous	5,375	4,677
Glass and enamel	6,982	13,861
Hydrofluoric acid	121,983	118,452
Miscellaneous	673	122
Government stock pile	3,696	572
Exported	6,664	1,477
	158,724	153,750
Total:		
Ferrous	228,996	225,665
Nonferrous	10,189	7,421
Cement	1,094	646
Glass and enamel	21,059	29,859
Hydrofluoric acid	123,680	121,084
Miscellaneous	3,884	2,730
Government stock pile	8,070	24,396
Exported	9,044	1,980
	406,016	413,781

[a] Includes pelletized gravel.

feasible to mine many deposits composed of interlocking fluorspar crystals and other minerals which previously could not be separated. Flotation is now employed generally by most companies, since it is applicable not only to material being mined today but also to the recovery of high-grade concentrates. These concentrates are valuable in making hydrofluoric acid and ceramic products, and find limited use in making briquets to be used in the manufacture of open-hearth steel.

The glass industry, which ranks third as a consumer of fluorspar, used 27,315 tons in 1944, or an increase of 33 percent over 1943 (table 61). Fluorspar is used in the

Table 65.—Fluorspar Consumed in Illinois and the United States, by Uses* (1939 to 1944)

	Steel	Hydrofluoric Acid	Ceramics	All others	Total
1939					
Illinois	[a]	[a]	[a]	[a]	75,257
United States	125,371	27,463	21,884	5,077	179,795
1940					
Illinois	[a]	[a]	[a]	[a]	104,698
United States	162,772	33,608	20,269	8,469	225,118
1941					
Illinois	[a]	[a]	[a]	[a]	133,333
United States	214,120	52,674	32,051	9,640	308,485
1942					
Illinois	77,947	62,573	7,520	6,754	154,794
United States	225,233	68,083	22,813	15,171	351,300
1943					
Illinois	89,789	89,599	6,741	10,327	196,456
United States	220,809	123,680	21,059	23,354	388,902
1944					
Illinois	71,516	81,493	14,058	8,184	175,251
United States	219,361	121,084	29,859	17,101	387,604

* U. S. Bureau of Mines; Minerals Yearbooks 1940-1943; M.M.S. 1278, April 23, 1945.
[a] Statistics not available by uses until 1942.

manufacture of opal, opaque, and colored glass to be used in such finished commodities as lamp globes, bulbs, soda fountains, containers for food, toilet and medicinal preparations, and lavatory fixtures. From 50 to 500 pounds of fluorspar are used per 1000 pounds of sand in the manufacture of glass, depending upon the type of product desired. Substitutes for fluorspar have been tried but offer little competition either because of higher cost or lower efficiency. An even higher grade of fluorspar (60 percent through a 100-mesh screen) is required for the manufacture of vitreous enamel than for opaque or colored glass (55 percent through 100-mesh screen). These commodities include sinks, bathtubs, stove parts, refrigerators, toilet fixtures, etc., where vitreous enamel coatings are applied to iron or steel. Similar coatings are also applied to pottery, brick and tile. Since civilian consumption of such products has been so drastically curtailed during the war, it appears that the market for this mineral for enameling purposes will show a marked upward trend with the close of the war.

Consumption of fluorspar in the United States and Illinois by uses since 1939 is shown graphically in figure 12. Statistics by uses in Illinois are not available before 1942, so for the period 1939–1941 only the total consumption for Illinois can be shown.

Although forty states reported consumption of fluorspar, three states—Illinois, Ohio, and Pennsylvania—used 239,584 tons, or 58 percent of the toal consumption (table 62). Pennsylvania displaced Illinois as chief consumer in 1944, but Illinois retained its lead as the largest consumer of fluorspar in hydrofluoric acid. Pennsylvania led in consumption of fluorspar in both steel and glass manufacture.

Figure 13 shows the average consumption in the United States over a characteristic six-year period, from 1935 to 1940 inclusive, as compared with the 1944 consumption and a similar comparison for the same years as to the source of the fluorspar used. Since statistics for imports during 1944 cannot be made public they have been included with "Other states" for that year.

TABLE 66.—FLUORSPAR SHIPPED FROM MINES IN ILLINOIS, 1943 AND 1944, BY KINDS AND BY USES[a]

Kind of Fluorspar	1943			1944			Percent change in amount from 1943
	Amount tons	Value at mines		Amount tons	Value at mines		
		Total	Av.		Total	Av.	
Metallurgical	84,929	$2,482,319	$29.23	64,072	$1,925,399	$30.05	—24.6
Flotation concentrates	104,131	3,810,470	33.47	101,105	4,029,592	35.98	— 2.9
Ground	9,729			11,082			+13.9
Total	198,789	$6,292,789	$31.66	176,259	$5,954,991	$33.79	—11.3
Use							
Steel	89,789	$2,624,000	$29.22	71,516	$2,143,780	$29.97	—20.3
Foundry	1,204	28,632	23.78	856	23,571	27.42	—28.9
Glass and enamel	6,741	227,849	33.80	14,058	512,420	36.45	+108.4
Hydrofluoric acid	89,599	3,030,442	33.82	81,493	2,974,892	36.55	— 9.0
Other industries	9,123	309,737	33.95	7,328	262,353	35.80	—19.5
Total	196,456	$6,220,660	$31.66	175,251	$5,917,016	$33.76	—10.8
Exported	2,333	72,129	30.91	1,008	37,975	37.67	—56.8
Total	198,789	$6,292,789	$31.66	176,259	$5,954,991	$33.79	—11.3

[a] Compiled from canvass made by U. S. Bureau of Mines.

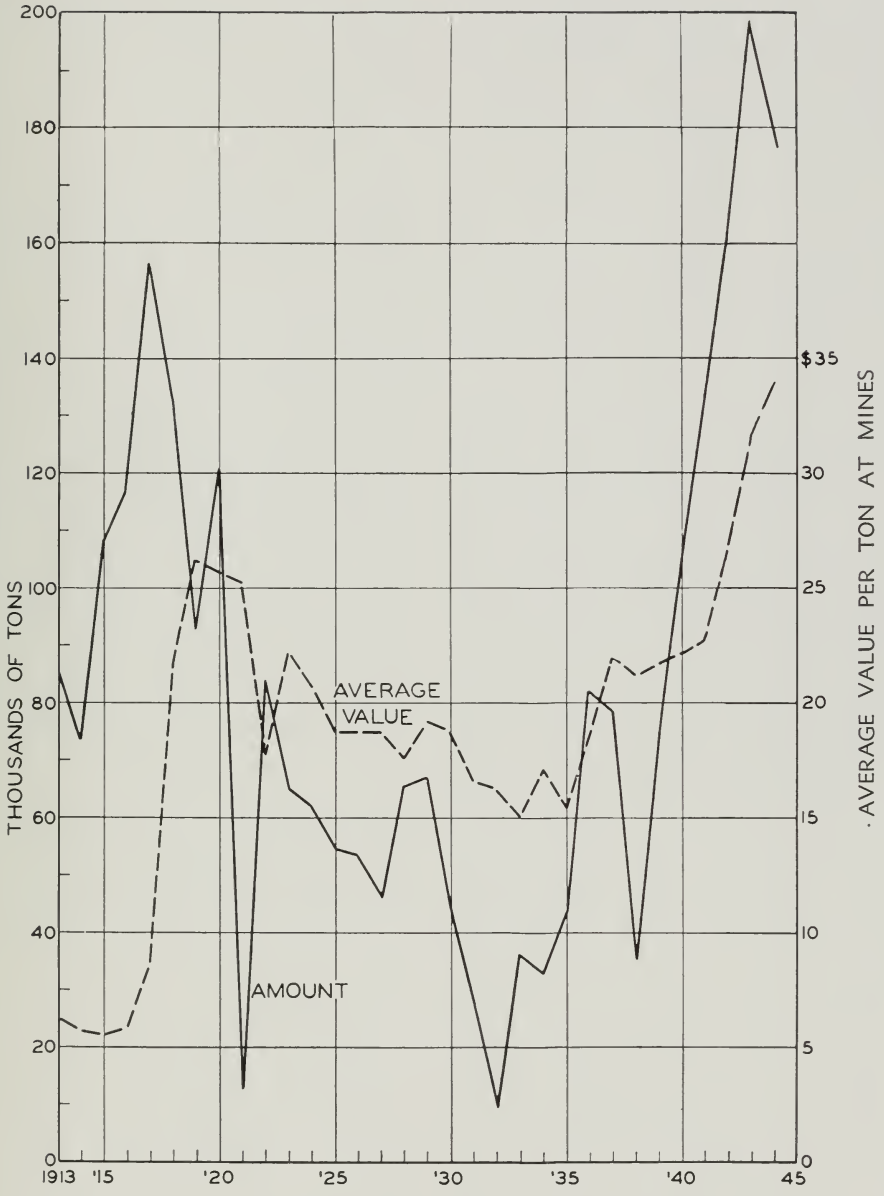

FIG. 14.—Fluorspar from Illinois mines, annual shipments and annual value, for 1913–1944.

TABLE 67.—FLUORSPAR SHIPPED FROM ILLINOIS MINES, 1939 AND 1944[a]

Year	Tons	Value at mines		Year	Tons	Value at mines	
		Total	Av.			Total	Av.
1939	75,257	$1,638,693	$21.77	1942	161,949	$4,306,750	$26.59
1940	104,698	2,313,747	22.10	1943	198,789	6,292,789	31.66
1941	133,333	3,047,247	22.85	1944	176,259	5,954,991	33.79

[a] U. S. Bur. Mines, Minerals Yearbooks, and Mineral Market Report, M.M.S. 1278, April 23, 1945.

FLUORSPAR IN ILLINOIS

Although the mining of fluorspar in Illinois dropped 11 percent in 1944, Illinois still maintained its rank as chief producing state in the nation and made 43 percent of the total shipments of fluorspar.

Shipments of fluorspar from the mines in Illinois are given for 1943 and 1944 in table 66 by kinds and uses. The manufacture of hydrofluoric acid was the high consumer of fluorspar for the first time in 1944, with the steel industry running a close second. An interesing note in the fluorspar industry for 1944 is the rapid increase in the use of fluorspar in Illinois in the manufacture of glass and enamel. As shown in table 66, this industry used 108 percent more fluorspar in 1944 than in 1943, or an increase from 6,741 tons to 14,058 tons in 1944. Although still a small item in total consumption of fluorspar in Illinois, the rapid increase is noteworthy.

Annual shipments and average value of fluorspar from Illinois since 1913 are presented graphically in figure 14, showing the effect of two world wars on this industry.

Shipments of fluorspar from Illinois mines from 1939 to 1944 are shown in table 67. The value in dollars of the fluorspar shipped from mines in Illinois in 1944 was $5,954,991, compared with $6,292,789 in 1943.

Some months before the entry into the war it was realized that the fluorspar deposits of Illinois were to play an increasingly important part in national affairs. Recognizing the desirability of increasing and bringing up to date knowledge of the fluorspar producing district in Illinois, a general survey was begun by the Illinois State Geological Survey of the mines and prospects of the district, noting location and principal features of each, as well as a revision of the geologic map of that section. This study has resulted in the accumulation of a sizable body of additional geologic knowledge of the fluorspar district. When this knowledge is made generally available to the public it will constitute a valuable compilation of geologic data and an accurate record of the character of the ore bodies in the various mines for future use. In years to come prospective mine operators or investors will have more than local, and possibly biased, reports on which to base their decisions, and in case of another national emergency the data now on hand may be of considerable time-and-money saving value.

PRICES

Present prices remain unchanged from 1943 at $37 per ton for acid and ceramic grade spar and $30–$33 per ton for metallurgical spar. Prices for metallurgical spar vary according to the "effective CaF_2 content." The average price per ton for Illinois spar in 1944 was $33.79, an increase of $2.13 over the preceding year. This increase probably reflects an increase in the proportion of ceramic grade and of the better grades of metallurgical spar produced and shipped. Current prices are to be compared with the 1940 average of $25.36 per ton for acid spar and $18.42 for metallurgical spar. The increased prices have been allowed by Office of Price Administration to permit wage increases and as an incentive to increased production.

ZINC AND LEAD

The Wisconsin-Northern Illinois region was the only important Central States zinc-producing region in which output of both crude ore and recoverable metals increased in 1944.

The zinc and lead ore and concentrates produced in northern Illinois in 1943 and 1944 were shipped to the custom flotation mill of the Vinegar Hill Zinc Company at Cuba City, Wisconsin.

In southern Illinois the bulk of the output of zinc and lead came from zinc-lead-fluorspar mines near Cave in Rock, Hardin County.

Illinois production of zinc and lead recovered from ores mined in Illinois during 1944 was valued at $2,004,600, as shown in table 68.

MISCELLANEOUS MINERALS

Included in this group are several mineral materials produced in Illinois by less than three producers for each material, so that details of production cannot be published without revealing individual operations. These materials are:

Peat, produced in northern Mason County for mixed fertilizer and other purposes. Illinois ranks first among the states in the production of peat.

Pyrites (coal brasses), produced in Henry County from coal-cleaning operations.

Sulfur, as elemental sulfur is recovered as a byproduct in the liquid purification of manufactured gas.

The total amount and value of these mineral materials just described, which were produced in Illinois during the past three years, are given in table 69. The total value for 1944 amounted to $107,400.

TABLE 69.—MISCELLANEOUS MINERALS[a], SOLD OR USED BY PRODUCERS IN ILLINOIS, 1942 TO 1944[b]

Year	Amount tons	Value at plants	
		Total	Av.
1942	* 34,179	*$149,327	*$4.37
1943	* 28,199	*117,895	*4.18
1944	[c]26,000	[c]107,400	4.12

* Revised figures.
[a] Minerals included: peat, pyrites, and sulfur from manufactured gas.
[b] Compiled from joint canvass made by Illinois Geological Survey and U. S. Bureau of Mines.
[c] Estimated.

TABLE 68.—ZINC, LEAD, AND SILVER, RECOVERED FROM ORES MINED IN ILLINOIS, 1942 TO 1944[a]

Metal	Unit	1942			1943			1944			
		Amount	Value[b]		Amount	Value[b]		Amount	Value[b]		Percent change in amount from 1943
			Total	Av.		Total	Av.		Total	Av.	
Zinc	Tons	9,389	$1,746,354	$186.00	*5,851	*$1,263,816	*$216.00	7,482	$1,676,000	$224.00	+27.9
Lead	Tons	2,344	314,096	134.00	*2,043	* 306,450	150.00	2,080	328,600	158.00	+ 1.8
Silver	Troy ozs.	104	74	0.711	*2,153	* 1,531	0.711	[c]	[c]	—	—
Total		—	$2,060,524	—	—	*$1,571,797	—	—	$2,004,600	—	[d]+27.5

* Revised figures.
[a] U. S. Bur. of Mines, Minerals Yearbooks and Mineral Market Reports.
[b] Value for zinc and lead based on yearly average price received by producers, including bonus payments by Metals Reserve Co. for overquota production, as determined by U. S. Bureau of Mines.
Value for silver based on U. S. Treasury buying price for newly mined silver.
[c] Not available.
[d] Percent change in value from 1943.

MINERALS PROCESSED, BUT NOT MINED, IN ILLINOIS

Included in this group are mineral materials which are processed in Illinois but are mined in other states. Production of these materials in Illinois during the past three years is given in table 70, as far as the data are available.

Coke and byproducts.—All coke produced in Illinois is made in byproduct ovens. most of it from coal mined in the eastern bituminous fields. Coke produced from Illinois coal is not differentiated from the other, so table 70 gives the entire amount of coke made in Illinois. Details of coke manufacture are given in this report in the section on "Coke and Byproducts." (see p. 44)

Packaged fuel.—This material is processed in Illinois from the fines that result from the storage and handling of eastern coal. Details are given in the section on "Fuel Briquets and Packaged Fuel" (see p. 41). Data cannot be published on the production of *fuel briquets* in Illinois without revealing individual operations.

Pig iron.—This basic product in the steel industry is produced in Illinois from iron ore mined in the Lake Superior district and shipped in by water.

Sulfuric acid.—This material is produced in Illinois as a byproduct of the smelting of zinc ores and is also produced from sulfur at zinc plants.

Slab zinc.—This basic product in the zinc industry is produced in Illinois from ores mined in Illinois and from ores mined in other states. Zinc recovered from Illinois ores is included in table 68. That recovered from out-of-state ores is included in "Total processed" in table 70.

Ground feldspar is made in Illinois from crude feldspar which is mined in South Dakota. It is used in the manufacture of white ware and enamels and for other purposes. Data cannot be published on feldspar grinding in Illinois without revealing individual operations, but are included in "Miscellaneous minerals processed," table 70.

Magnesium compounds are processed in Illinois from out-of-state dolomite. Data on these are included in "Miscellaneous minerals processed," table 70, to avoid revealing individual operations.

Mineral pigments are produced in Illinois from crude mineral earth pigments from various sources. Data on these are included in "Miscellaneous minerals processed," table 70.

Pig lead is made in Illinois by smelting lead ores; that obtained from ores mined in Illinois is given in table 68. Data on pig lead produced in Illinois from ores mined in other states are not available.

Expanded vermiculite is produced in Illinois by heat-treating crude vermiculite which is mined in the West. Production figures are not available.

Alumina, phosphates, and other processed mineral materials are produced in Illinois in large amounts, but data for them are not available.

The total 1944 value of mineral materials which were processed in Illinois but mined in other states, as given in table 70, amounted to $202,357,378.

The values of pig lead, expanded vermiculite, alumina, phosphates, and other mineral materials, if known, would greatly increase the total given in table 70.

TABLE 70.—MINERALS PROCESSED, BUT NOT MINED IN ILLINOIS, SOLD OR USED BY PRODUCERS IN ILLINOIS, 1942–1944[a]

Kind	1942			1943			1944			Percent change in amount from 1943
	Amount tons	Value ar plants		Amount tons	Value at plants		Amount tons	Value at plants		
		Total	Av.		Total	Av.		Total	Av.	
Coke (byproduct)[b]	*3,706,000	*$27,519,000	$7.42	*3,660,000	*$29,662,000	* $8.10	3,875,000	$34,061,000	$ 8.79	+ 5.9
Coke breeze	* 330,000	* 791,000	* 2.40	* 338,000	* 939,000	* 2.78	311,000	933,000	3.00	— 8.0
Byproducts[c]	—	* 9,888,000	—	—	* 12,415,000	—	—	10,256,000	—	[i]—17.4
Total	—	* 38,198,000	—	—	* 43,016,000	—	—	45,250,000	—	[i]+ 5.2
Packaged fuel[d]	4,980	60,001	12.05	3,081	38,445	12.48	1,837	23,037	12.55	—40.1
Pig iron	5,871,858	125,662,134	21.30	5,920,894	126,910,295	21.30	5,686,397	118,953,078	21.00	— 4.0
Sulfuric acid[e]	215,494	2,036,418	9.45	* 259,302	* 2,481,520	* 9.60	[f]240,000	[f]2,280,000	[f]9.50	— 7.5
Slab zinc, from Illinois ore[g]	9,389	1,746,354	*186.00	* 5,851	* 1,263,816	*216.00	7,482	1,676,000	224.00	+27.9
From other ore[g]	166,066	* 30,888,246	*186.00	* 215,829	* 46,619,084	*216.00	147,880	33,125,100	224.00	—31.5
Total zinc smelted in Illinois[g]	175,455	* 32,634,600	*186.00	221,680	* 47,882,900	*216.00	155,362	34,801,100	224.00	—30.0
Miscellaneous minerals processed[h]	42,849	2,436,135	56.85	35,855	2,872,624	80.12	35,808	2,726,163	75.29	— 0.1
Total processed, but not mined, in Illinois	—	*$199,280,934	—	—	*$221,937,968	—	—	$202,357,378	—	[i]— 8.8

* Revised figures.
[a] Compiled from U. S. Bur. Mines Minerals Yearbooks and Mineral Market Report 1316 (Slab Zinc), July 4, 1945.
[b] See table 28—Coke and Byproducts.
[c] Figures for some byproducts not available, due to war censorship.
[d] See table 27—Packaged Fuel.
[e] 60° Baumé—from zinc smelting and sulfur.
[f] Estimated for 1944.
[g] Value for zinc based on yearly average price received by producers, including bonus payments by Metals Reserve Co. for overquota production, as determined by U. S. Bureau of Mines. Figures for zinc smelted from Illinois ore are not included in "Total processed" in this table, but are included in table 68.
[h] Includes ground feldspar, magnesium compounds, mineral pigments.
[i] Percent change in value from 1943.